Embodying Comics:
Reinventing Comics and Animation for a Digital Performance

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Özge Samancı

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Embodying Comics:
Reinventing Comics and Animation for a Digital Performance

Approved by:

Dr. Alexandra Mazalek, Advisor
School of Literature, Communication, and Culture
Georgia Institute of Technology

Dr. Kenneth Knospel
School of Literature, Communication, and Culture
Georgia Institute of Technology

Dr. Janet Horowitz Murray
School of Literature, Communication, and Culture
Georgia Institute of Technology

Dr. Claudia Rebola Winegarden
School of Literature, Communication, and Culture
Georgia Institute of Technology

Dr. Jay David Bolter
School of Literature, Communication, and Culture
Georgia Institute of Technology

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SUMMARY

In the digital era, the comics medium has been transported from print to computer screen, and thus its evolution takes place in digital performances based on full-body interaction technologies. The major implication of this process is that the conventions of comics will be merging with those of performance, film, and animation.

In a comics story implemented with full-body interaction technologies, representational space shifts from two to three dimensions. Physical elements can now easily be combined with virtual ones. The participants' contribution to the experience now includes a larger set of kinesthetic choices. Earlier media offer the readers the opportunity to read the story with their eyes, turn pages, and click a mouse. Instead of one or perhaps two readers of print and screen-based comics, a digital performance can be experienced by a group of viewers positioned in space in various ways. By utilizing the tools of computer vision, the projection of a participant can be made the main character of the comics story. Consequently, the comics and animation frame changes when moved to digital performance spaces. The frame becomes embodied, nested, elastic, and dynamic. The first two qualities relate to the physicality of the medium, where performers and viewers are simultaneously present in both the real and fictional spaces. The second two qualities relate to the procedurality of the medium and the potential for computational manipulation within the frame based on changing relationships across space (distance) and time (story). The resulting new expressive opportunities include: 1. Impossible Story Worlds; 2. Plasticity of Digital Double; 3. Movement in Comics; 4. Infinite Canvas; 5. Comic Strip and Character Generators; 6.

Offending the Viewer; 7. Fragmentation of Space-time; 8. Simultaneity ; 9. Delay; 10. Expansion of Performance Set; 11. Massive Number of Participants; 12. Creating Unaware Participants with Surveillance Technologies; 13. Elastic Distance and the Mobility of Components;14. Intricate Uses of Props; 15. Mediated Self-reflection; 16. Nested Boundaries of Illusion; 17. Elastic, Dynamic, and Embodied Frame; 18. Dynamic and Participatory Thought Balloons, Movement Lines, Typographic Components, and Icons

Embodied Comics is as much a form of digital performance based on full-body interaction technology as it is a storytelling environment. A digital artist can create or design various stories with Embodied Comics. Our installation, *Egg's Journey,* is an example of a storytelling with Embodied Comics. *Egg's Journey* investigates an unexplored possibility, (a change in the conventions of comics in a digital performance) and instantiates the theoretical outcomes of this dissertation project.

CHAPTER 1

INTRODUCTION

1.1 The Significance and Necessity of this Study for Media Studies

Having originated in print, the comics medium has moved to the computer screen in the digital era. Scott McCloud traces the lineage of comics from ancient times to the digital era. The examples he gives in his two-volume work, *Understanding Comics* and *Reinventing Comics*, ranges from Egyptian tomb paintings to Web comics. The earliest examples drawn from art history indicate the important moments for the establishment of the comics medium. McCloud in his taxonomy marks the following works and ideas as milestones: a sequence of images with a zigzag reading path from bottom left to upper right on the tomb of *Menna*, an ancient Egyptian Scribe; the invention of printing for the dissemination of visual art; Hogarth's sequenced narrative paintings designed for viewing side by side; Topffer's inclusion of panel borders, cartooning, and combination of words and images. McCloud, by using examples from the 20th century of comics such as works of Will Eisner and Art Spiegelman, explains the established conventions of comics including the idea of closure, the representation of time, sound and motion, and the use of line, frame, and color.

McCloud in his survey examines the transition of comics from print to screen and characterizes the impact of computation on comics with the following paraphrased statements: the page was replaced by the screen; the screen became an infinite canvas; the readers began to alter the flow of the story with real time interaction such as scrolling, zoom in and out; frames came to include animation; and the audio became a part of the

comics in the screen. Moreover, the publication of comics is easier for individuals via the World Wide Web. As a consequence of this shift from print to screen, the conventions of comics which were related to painting and photography now merge with the conventions of film and animation.

An expansion of Scott McCloud's work is necessary since the evolution of the comics medium will be continuing in new digital formats. This work is aimed at contributing to this expansion by exploring the ways that full-body interactive installations can revise and transform the conventions of the medium. Obviously, my analysis will embrace a shorter span of time in the history of comics. I will also look at an emerging environment, Embodied Comics, which has an uncertain future. Our installation *Egg's Journey*, an example of Embodied Comics, provides the opportunity to examine the possibilities of this uncertain but promising future.

Embodied Comics form a subset of full-body interactive installations. *Egg's Journey* is so far the only example of storytelling with a digital performance in a full-body environment contextualizing comics and animation. Consequently, there are not enough examples for making categories and criticizing the meaning-making potential of Embodied Comics. To be able to talk about the future of comics as a form of digital performance, I take a pool of full-body interactive installations as my examples.

The motivation for taking comics out of comic books and off computer screens is an artistic and scholarly curiosity about the invention of comics conventions, and the narration potential offered by Embodied Comics. The conventions of Embodied Comics are neither conventions of animation nor conventions of comics. They constitute a set of novel conventions derived from these traditions. For example, in an Embodied Comics

story, a frame border can be moved, bent, and transformed by a participant who is the main character in the story (see Figure 1.1.1).

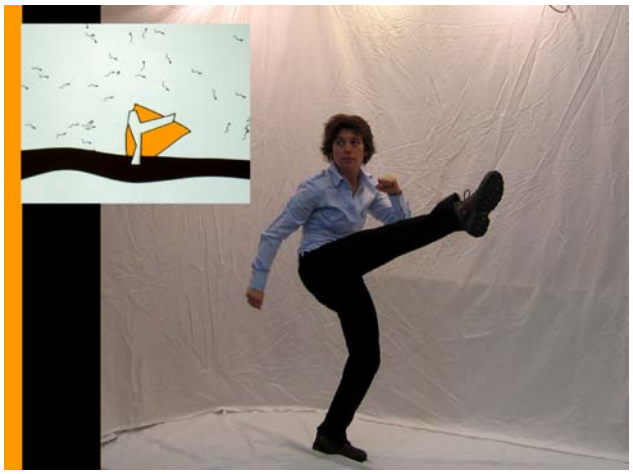

Figure 1.1.1: The performer in *Egg's Journey* sees herself in the egg and manipulates the elastic borders of the egg's membrane.

Since this frame border can be manipulated and does not stand still, it can not be categorized as a comics convention anymore. Due to the agency that the participant has been given, the mobile frame border cannot be categorized as an animation convention. A manipulable frame border, then, is one of the many novel conventions that an Embodied Comics environment can offer.

In a comics story implemented with full-body interaction technologies, representational space shifts from two to three dimensions. Physical elements can be combined with virtual ones. The participants' contribution extends over a large set of kinesthetic choices, in addition to reading the story with their eyes, turning pages, and clicking the mouse as in earlier media. Instead of one or perhaps two co-located readers of print and screen-based comics, a digital performance can be experienced by a group of viewers positioned in various ways. By utilizing the tools of computer vision, the projection of a participant can be made the main character in the comics story.

Consequently, full-body interactive installations can revise and transform the earlier medium's conventions in four ways: physicality-distance, procedural quality of time, nested boundaries of illusion, and embodiment.

1.2. Definitions and Motivations

In order to discuss the conventions and narration potential of Embodied Comics, one needs to decide whether Embodied Comics is a medium or a genre. First, let us pose a simpler question: Is comics a medium or a genre? Scott McCloud (2000) defines comics as "juxtaposed pictorial and other images [such as words] in deliberate sequence, intended to convey information and/or to produce an aesthetic response in the viewer" (p. 9). In his definition, McCloud does not identify comics as either a medium or a genre. In order to answer this question we need to set the definitions of "medium," "convention", and "genre".

Murray (2006) defines a medium as "an element or combination of elements in the physical world that affords and transmits representational inscription" (p. 2). The comics environment qualifies as a mature medium since it has an "established, transparent technology of inscription [paper, ink, print], established unambiguous formatting conventions and relatively noise-free channels [frame, speech balloons, movement lines, contour lines], and established traditions of production, representation, and interpretation [super hero comics, manga, autobiographic comics, etc.]" (p. 21).

Murray's definition of medium includes the term convention, and Bordwell (2005) defines convention in the following way: "[a] tradition, a dominant style, a popular form—some such elements will be common to several different artworks. These common traits are usually called conventions" (p. 52). Comics conventions include:

movement lines behind a running character indicating the character's directional movement; irregular borders of a speech balloon indicating anger; wavy frame lines signifying a depth-of-knowledge scene (dreams, hallucinations); omitted frame borders indicating a timeless quality; the length of the panel depicting the duration of time; a cloud-shaped border indicating a thought balloon; the size, shape, and color of typographic components indicating sound effects.

According to Bordwell (2005), it is easier to recognize a genre than to define it. Frye (2000) claims that "by identifying different conventions used in various kinds of fiction, the critic will, for example, avoid judging a romance (which involves stylized or idealized characters) by reference to methods of characterization that are appropriate to the realistic novel" (p.22). In that sense, the genre categories are to be employed for describing and analyzing the artifacts but not for evaluating them. The comics medium has genres such as Manga, Doujinshi, Philosophical, Super Hero, Autobiographical comics, and so on.

The remediation of the aesthetics of comics in film, animation, painting, and other visual media led to the perception of comics as a genre. For example, a series of contemporary movies remediate the aesthetic of comics in film such as *V For Vendeta* (2005), *Matrix Trilogy* (1999, 2003, 2003), *SinCity* (2005), *Road to Perdition* (2002). Another group of contemporary movies appear as adaptations of popular comics such as *Hulk* (2003), *Spiderman* (2002), *Superman Returns* (2006), and *Batman Begins* (2005). This movement of utilizing the inheritance of comics in contemporary cinema represents an emerging "comics genre" in film. Comics is originally a medium, and it can become a genre once it is encapsulated in another visual medium.

The same discussion also applies to animation. Furniss (1998) quotes from Norman McLaren: "[a]nimation is not the art of *drawings* that move but the art of *movements* that are drawn; what happens between each frame is much more important than what exists on each frame; animation is therefore the art of manipulating the invisible interstices that lie between the frames" (p. 5). According to McLaren's definition, the components of animation are the frame, the movement of inanimate objects, and two-dimensional representation. His definition does not clarify whether animation is a medium or a genre. According to Murray's definition (2006), animation meets the criteria of a medium. Since the term *animation* also refers to a kind of movie created with the animation medium, animation is also understood as a moving picture genre with its own conventions. The long domination of Disney Studio and the efforts of reaction studios such as Terrytoons, Walter Lantz, WB, MGM, and UPA, have contributed to the understanding of the animation medium as a genre. Consequently, animation is both medium and genre.

Embodied Comics is a subgenre of full-body interactive installations while the full-body interactive installations are a subgenre of digital performances. Embodied Comics is not a mature medium since it does not have "established unambiguous formatting conventions and relatively noise-free channels, and established traditions of production, representation, and interpretation" (p. 21). However, Embodied Comics has a potential to be a mature medium in the future.

I categorize Embodied Comics as a subset of digital performance pieces but not necessarily as a subset of digital games. Dixon (2007) defines digital performance as "all performance works where computer technologies play a *key* role rather than a subsidiary

one in content, techniques, aesthetics or, delivery forms" (p. 3). Since the definition of digital performance is very broad we need to narrow it down by clarifying the distinction between digital games and digital performances.

Thompson's (1985) broad definition of performance includes three components: text, the actor/character, and audience. "Performance is interestingly placed at the intersection of the text, the actor/character and the audience" (p.138). Salen and Zimmerman (2003) define game as "a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome" (80). Two of the components of performance, performer (actor/character) and audience, are not necessarily present in the definition of game. The categorization of an artwork as a digital game or as a digital performance can be made according to the presence of two roles, a performer and a viewer. There will be pure digital games, pure digital performances, and a region in between (see Figure 1.2.1).

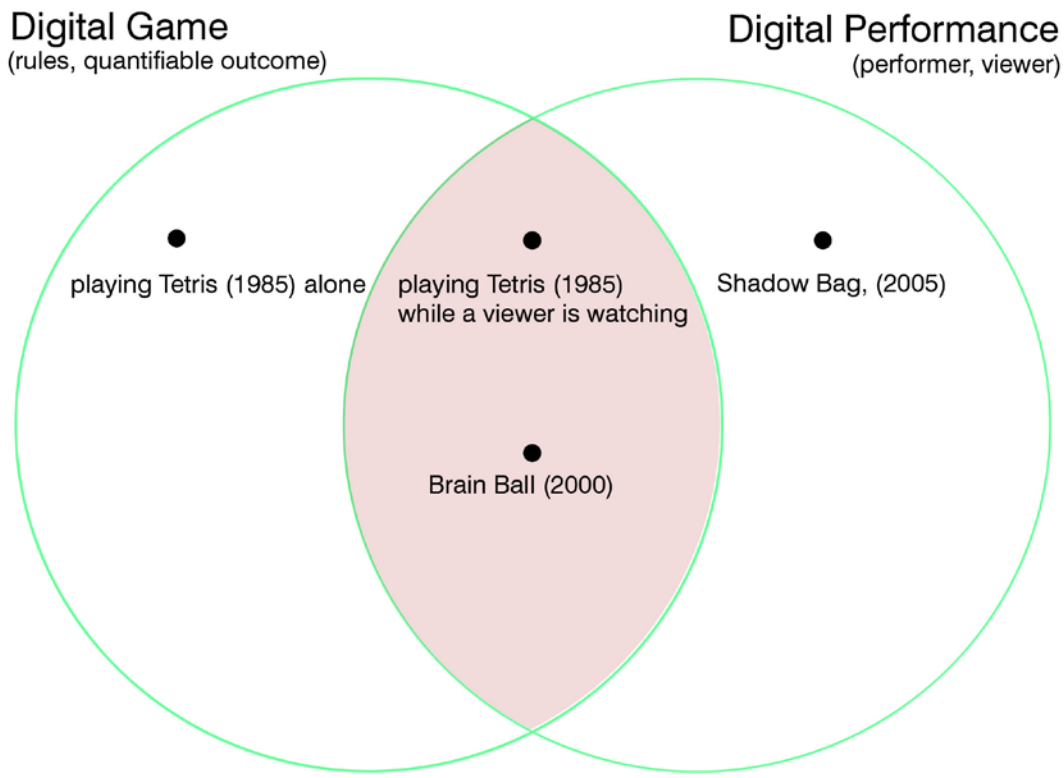

Figure 1.2.1 Distinction between digital games and performance

For example, *Tetris* (1985), when played alone on the computer, can be categorized as a digital game since the roles of performer and viewer are not present. If a gamer playing *Tetris* is being watched by a viewer, then in this new context this same activity can be categorized as both digital game and performance. In Snibbe's *Shadow Bag*, (2005) the performer's shadow is captured in silhouette and projected onto a screen with unpredictable variation. *Shadow Bag* is unambiguously a digital performance piece (see Figure 1.2.2) and there is almost no game component in it since there is no artificial conflict, no rules, and no quantifiable outcome behind seeing one's own shadow in different forms.

Figure 1.2.2 Snibbe's *Shadow Bag* (2005) as an example of digital performance, http://snibbe.com/scott/body_image/shadow_bag/index.html

In *Brain Ball* (2000), two participants wear strips that measure their brainwaves. As a consequence of their biofeedback, if one performer is more relaxed than the other the more relaxed participant can move the ball forward and win the game by reaching the circle in front of the other participant (see Figure 1.2.3).

Figure 1.2.3 *Brain Ball* (2000) as an example of both digital game and performance, http://smart.tii.se/smart/projects/brainball/index_en.html

Brain Ball appears as both digital performance and digital game since it includes performers and viewers, and it offers an aim to the two participants and rules to reach that aim. In *Brain Ball,* even if there are no viewers other than the two gamers, since each gamer will be watching the other, *Brain Ball* still fits in the digital performance category in addition to the digital game category.

In participatory theater, the distinction between performer and viewer may blur if the viewers take action in the drama. The performance pieces that utilize the digital medium blur even further the distinctions between performer and viewer. For example, the performer and the viewer can be the same person, as happens in many full-body computer vision installations such as *Text Rain* (1999). In *Text Rain*, the performer is the viewer of her or his own image projected on the screen.

Another subset of digital performance is full-body interactive installations which require the performers' full-body movement for the interaction. Murray (1997) defines the affordances of digital media as "procedural, participatory, spatial, and encyclopedic" (p. 71). As a product of the digital medium, the full-body interactive installations offer the same set of affordances with an emphasis on participatory quality, since full-body interactive installations allow the participant to have a large kinesthetic experience by using their bodies. Moreover, the procedural abstraction of the participant's projections and the procedural manipulation of time emphasize on the procedural quality of full-body interactive installations. With the emphasis on participation and the procedural manipulation of both time and the participant's self-projection, interactivity becomes the main affordance of full-body interactive installations. This kind of interactivity is coherent with Murray's (1997) definition of interactivity as the combination of procedural and participatory quality of digital media.

In the narrations constructed for full-body interaction technologies, there are multiple fourth walls since the performers' and the viewers' experiences are different from one other. In order to discuss the narrative potential offered by the complexity of the fourth walls in full-body interactive installations, we need to define what we mean by the

fourth wall. The definition of the fourth wall is connected to definitions of the alienation effect and self-consciousness. Brecht (1957) defines the alienation effect (verfremdungseffekt) as a theatrical and cinematic device that causes an interruption in the process of identification. According to Brecht. the alienation effect "prevents the audience from losing itself passively and completely in the character created by the actor, and which consequently leads the audience to be a consciously critical observer" (p. 91). Consequently, each alienation effect makes the viewer self-conscious about the film-watching process.

Definitions of self-consciousness differ. According to Stam (1985) "[r]eflexivity … points to its own mask and invites the public to examine its design and texture" (p. 1). Bordwell (1985) defines self-consciousness in cinema as "the extent the narration displays a recognition that it is addressing an audience" (p. 58). Stam (1985) defines reflexivity in cinema as "films which point to their own factitiousness as textual constructs." (p. 1). Stonehill (1988) defines self-consciousness in novels as "an extended prose narrative that draws attention to its status as a fiction" (p. 3). The combination of all these definitions offers a definition for visible narration; the fiction makes the narrator, audience, or narration visible. In the theater the same technique, i.e., creating alienation and making the narration visible, is referred to as breaking the fourth wall, the invisible barrier preventing the action of the play from invading the real world.

Table 1 compiles all the definitions of media that I have used thus far to establish a framework for Embodied Comics. Table 2 gives examples of pieces that are combinations of performance, comics, animation, and games. Embodied Comics gathers all types of media under the same umbrella.

Table 1.2.1 Basic components of media that form Embodied Comics

Medium	**Components**
Performance	text, actors, viewers
Comics	frame, story, 2D representation
Animation	frame, movement of inanimate objects, 2D representation
Games	rules, quantifiable outcome

Table 1.2.2 *Embodied Comics: Egg's Journey* is a combination of performance, comics, animation, and games

Medium	**Example**
Performance	*Shadow Bag* (2005)
Comics	*Persepolis* (2004)
Animation	*Duck Amuck* (1953)
Games	*Tetris* (1985)
Performance and comics	lightening sketches (McCay's performance in *Gertie the Dinosaur* (1914))
Performance and animation	*Drawn* (2006)
Performance and games	*Brain Ball* (2000)
Comics and animation	*Modern Living* (1998)
Comics and games	*Pictionary* (1985)
Performance, comics, and animation	*Messa Di Voce* (2003)
Performance, comics, and game	No example
Comics, animation, game	*Sims* (2000)
Performance, animation, game	*Eye Toy: Jackie Chan Adventures* (2004)
Performance, comics, animation, game	***Embodied Comics: Egg's Journey* (2007)**

1.3. Thesis Statements

The comics and animation frame changes when moved to digital performance spaces. The frame becomes embodied, nested, elastic and dynamic. The first two qualities relate to the physicality of the medium, where performers and viewers are simultaneously present in both the real and fictional spaces. The second two qualities relate to the procedurality of the medium and the potential for computational manipulation within the

frame based on changing relationships across space (distance) and time (story). The resulting new expressive opportunities include:

1. Impossible Story Worlds;

2. Plasticity of Digital Double;

3. Movement in Comics;

4. Infinite Canvas;

5. Comic Strip and Character Generators;

6. Offending the Viewer;

7. Fragmentation of Space-time;

8. Simultaneity ;

9. Delay;

10. Expansion of Performance Set;

11. Massive Number of Participants;

12. Creating Unaware Participants with Surveillance Technologies;

13. Elastic Distance and the Mobility of Components;

14. Intricate Uses of Props;

15. Mediated Self-reflection;

16. Nested Boundaries of Illusion;

17. Elastic, Dynamic, and Embodied Frame;

18. Dynamic and Participatory Thought Balloons, Movement Lines, Typographic Components, and Icons

1.3.1. Embodiment: Performance Space as a Frame

Full-body interactive installations exist both in real-space and in the comics world so they blur the distinction between the two. Unlike printed comics, the viewers are not just looking or pointing through a frame in a window (paper or computer screen). In full-body interactive installations, the performance space becomes the frame in which the participants are acting and performing within the comics world. Consequently, even though the following manipulations can be done with a mouse on a computer screen, the impact will be drastically different in cases with full-body interaction.

- Full-body interactive installations offer an elastic frame border, dynamic contents for a single frame, participatory borders for speech-thought balloons, and dynamic movement lines which the performers can produce and manipulate with their bodies.
- Full-body interactive installations not only utilize the typographic components for verbal communication, but each letter can be a dynamic device that a participant can interact with.
- In full-body interactive installations, the methods of abstraction and simplification for the projection of the performer can be defined procedurally. The absence of profilmic reality in digital imaging increases the plasticity of the frame. The digital film adapts the conventions of the animation genre through this increased plasticity. Since digital media allow the procedural manipulation of the image, computer vision based environments can also benefit from this plasticity.

- Full-body interactive installations have rarely been used for storytelling. They have not introduced intricate uses of props as the film medium does. This area is fertile and open to development.
- The screen based Web comics use movement for interaction. The use of animation in a comics story does not necessarily make the narration animation-like.
- Scott McCloud's infinite canvas concept contains a vast potential to create new meaning-making strategies. Existing Web comics use a large and finite space rather than an infinite canvas. The procedurality and spatiality of digital media allows comics artists to generate literally infinite canvases. Geotagging is an unexplored possibility for collaborative digital comics creations. If the performance frame expands to an infinite canvas (entire social space), a massive number of participants can interact with the environment.

1.3.2. Nested Boundaries of Illusion: Frame in a Frame

- In the narrations constructed for full-body interaction technologies, the performers' and the viewers' experiences are different from one other, resulting in multiple boundaries of illusion that form a frame-within-a-frame representation. Within full-body interaction technology, the role of self-consciousness and self-reflexivity are more complicated than in film, comics, and animation media. The multiple boundaries of illusion can be contextualized in narrations in which some elements of the narration become visible to viewers while they are invisible to performers.

- By purposefully offending the viewers, the performers become vulnerable. Offense and vulnerability turn into meaning-making tools. If the artist can design a playful offense for the performer in an Embodied Comics environment, playful offense and vulnerability induce the production of humor. Creating playful offense and vulnerability can also create different agencies for different performers as well as the creation of non-repetitive nested boundaries of illusion.

1.3.3. Elastic: Distance and Borders of the Frame

- One of the significant apparati for manipulating the distance between the viewer and the representational panel is the camera. Most full-body interactive installations include a single camera mounted at a fixed location and a stationary representational panel. The meaning-making potential of the mobile camera and representational panel has not been sufficiently explored.
- In digital film, the advent of a virtual, miniaturized camera increased mobility and introduced extreme camera angles. An Embodied Comics environment can benefit from the mobility and extreme camera angles by establishing “impossible” story worlds such as the inside of a human body.
- Especially with surveillance technologies, digital media artists are able to create participants who are unaware of their contribution.
- In full-body interactive environments, a performer can push, bend, and drag the borders of the frame to varying distances with respect to her body. Because of this property, the frame becomes elastic.

1.3.4. Dynamic: Procedural Quality of Time and Production of Frames

- The contents of a single frame can be procedurally generated in time. Consequently, the contents of the frame become dynamic.
- Unlike earlier media, full-body interactive environments display flexible responsiveness, thus generating meaning by either delaying or simultaneously creating that response. Consequently, time-and space becomes fragmented. For example, procedurally taken snapshots, over the course of interaction, create automated content for the frames. These frames then supply a comic strip version of the interaction, enabling the full-body interactive environment to function as a comics story-generator.

CHAPTER 2

METHODOLOGY

2.1. Explanation of Methodology

In this study, I will investigate the future of comics as a form of digital performance. Embodied Comics is the only example of storytelling using digital performance in a full-body environment that contextualizes comics and animation. In order to explore the meaning-making potential of Embodied Comics, I will look at a set of full-body interactive installations and digital performance pieces within a framework developed by media-specific studies. My goal is to identify the affordances of full-body interactive installations for meaning-making.

There are major media-specific studies that explain and categorize the conventions and affordances of film, digital media, and comics. These studies are useful because they enable artists and scholars to consider the expressive potential of their medium of concentration. However, these studies have been criticized because they analyze their subject matter through only one lens, that of formalism. Since I will be using a similar approach for contextualizing my methodology, I will introduce the studies that explore the conventions or essentials of film, digital media, and comics; the criticism they have received; and the contribution they make to media studies.

The prominent film theorist, David Bordwell (2005) makes a well-built classification of film conventions, explaining their functions for meaning-making in film. New media theorists, Janet Murray (1997) and Lev Manovich (2001), create their own categorizations as a way of clarifying the essentials or principles of digital media. Scott

McCloud (1997) develops a similar approach for the medium of comics. Since I will be using McCloud's work extensively, I will specifically critique and clarify the points where I am in disagreement with him.

2.2. Media-Specific Studies

2.2.1. Film: David Bordwell

Bordwell's neo-formalist approach to the film medium receives the following criticism from a group of scholars including Žižek (2001). Bordwell in his entire set of writings uses formalism as if nothing has happened since Russian formalism. His theory does not employ structuralism, post-structuralism, semiology, feminist-marxist-psychoanalytic approaches in his taxonomy. In response, Bordwell (1996) in his book *Post-Theory: Reconstructing Film Studies*, claims that Lacanian psychoanalysis and certain variations of post-structuralism offer grand theories and use films as tools to illustrate their grand theories. These approaches are not designed to explore the meaning-making process in film narration. In my perspective, Bordwell's work is essential for film studies, especially for the beginning stage. Its well-organized structure and terminology-based approach helps us establish a base. This base enables us to construct other theories upon it. However, the neo-formalist approach is insufficient in cases that require an analysis of socio-political or psychological conditions.

2.2.2. Digital Media: Janet H. Murray and Lev Manovich

The project of establishing the essential affordances and principles for design for digital media can be criticized as problematic for two reasons. First, there is no clear-cut distinction between old and new media. Second, the emerging digital medium is still in formation. As the scope of digital media may be wider than we assume, we will have to

broaden our horizons for more comprehensive categorizations in the near future. If these characteristics are valid only for the present and are not permanent, then is it not premature to use characteristics of digital media as the basis for identifying essential affordances and design principles?

Murray's (1997) and Manovich's (2001) suggestion of fixed sets of qualities are significant for the following reasons. First, they made the earliest attempts to establish principles of the digital environment, providing a critical vocabulary for design critique. Secondly, Manovich's (2001) and Murray's (1997) efforts signify a contribution to the identification of a real breaking point between earlier media and the digital medium. For the moment, their terminology is useful for thinking about and learning the potentials of the digital environment for the creative process.

2.2.3. Comics: Scott McCloud

Scott McCloud's three-volume work on the medium of comics is unique since it provides an analytical survey of comics' conventions in the form of comics. McCloud's work jolts the perception of images, challenging the prominence of verbal expression in scholarly production. However, in McCloud's (1997) approach to the medium of comics, especially in *Understanding Comics*, there are over-generalizations about theories of communication, theories of identification, and the comparison of film/television to the medium of comics.

McCloud's (1997) approach to communication theories acknowledges the impossibility of perfect communication. However, it ignores the complexity of the communication models with their inclusion of feedback, second perceiver, social context, media channels, and the process of deciding what and how to communicate. McCloud

(1997) uses the light bulb icon in the minds of both the sender and the receiver (see Figure 2.2.3). His representation pays scant attention to the transformation of the idea from one mind to another and the impossibility of perfect communication. Moreover, communication via the comics medium is based on dissemination as opposed to McCloud's (1997) representation of one-to-one and face-to-face communication.

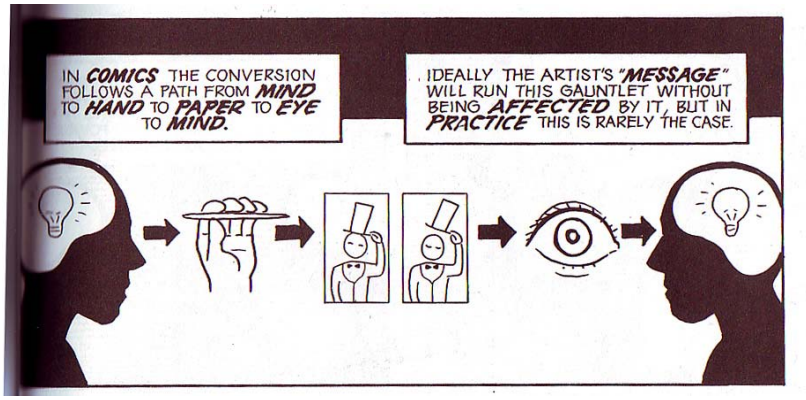

Figure 2.2.3.1 Scott McCloud's illustration of communication with comics in *Understanding Comics* (p. 195)

In contrast, Tufte's (2001) represents the communication process with *New Yorker* cartoon Cem's (1961) which includes transformation of message, the process of dissemination, and the social context (see Figure 2.2.3.2). Compared to McCloud's panel, Cem's drawing constitutes a more reliable model.

Figure 2.2.3.2 Drawing by CEM (1961), New Yorker, reproduced in Tufte's (2001) *The Visual Display of Quantitative Information* (p. 56)

A similar kind of over-generalization prevails in McCloud's (1997) comparison of film and television to the medium of comics in terms of viewers' mental participation. He defines the closure mechanism only in terms of simulating time and motion. McCloud (1997) claims that "while film makes use of audiences' imaginations for occasional effects, comics must use it [closure] far more often!" (p. 69) McCloud (1997) also argues that "the closure of electronic media is continuous, largely involuntary, and virtually imperceptible" (p. 68). Had he referred to 'motion closure of electronic media' instead of 'closure,' he would not have been over generalizing the case. If the essence of film is the cut, as Giannetti (1990) suggested, then the essence of film is also closure. The employment of the graphic match and the sound bridge as editing strategies, the off-screen spaces excluded by frame, use of metaphors, intertextuality, the clear/hazy descriptiveness of the word/image duality, and the whole identification mechanism constitute diverse forms of closure in cinema as well as in other narrative visual arts.

In order to emphasize the medium of comics' reliance on its viewers' mental participation, McCloud (1997) refers to McLuhan's (1964) distinction between hot and cold media. McLuhan (1964) claims that "[a]ny hot medium allows of less participation than a cool one, as a lecture makes for less participation than a seminar, and a book for less than a dialogue" (p. 23). McLuhan's (1964) cold media and hot media concept stimulates new thoughts on the subject but does not offer a solid theory since it is not possible to decide amount of the closure potential that a medium offers. The phenomenon of mental participation or closure is not only about the medium, it is also about the content that is communicated and the social context in which the communication takes place.

McCloud (1997) claims that when a character is represented in a simplistic form, this simplification increases the viewers' projection of themselves onto the character. He gives the example of his way of drawing himself as a simplified character with no eyeballs (see Figure 2.2.3.3).

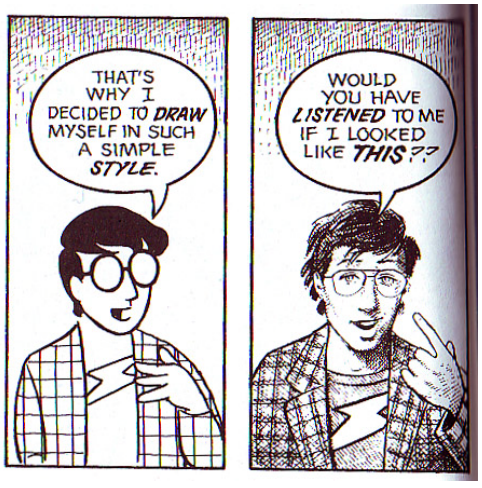

Figure 2.2.3.3 Simple versus realistic: McCloud's representation of himself in *Understanding Comics* (p. 36)

However, in practice, I relate to the realistic version better since lack of eyeballs creates an uncomfortable feeling. The simplistic version of the McCloud character reminds me of the awkwardness of talking to someone wearing sunglasses that hide the person's responses. Moreover, McCloud's (1997) bold statement about increased identification with simplified characters is not based on a sound theoretical basis. In fact, many mainstream movies offer a strong identification with the protagonist and attract millions of people with their extremely photorealistic representations.

2.3. Methodology of this Study

The methodology of this study may receive criticism similar to those of the scholars' works that have been discussed in this chapter. At the same time, since there are no studies exploring the expressive affordances of full-body interactive installations, this study will attempt to establish a foundation upon which subsequent theories may be constructed.

Bordwell (1991) defines meaning-making as follows:

> Comprehension and interpretation thus involve the construction of meaning out of textual cues. In this respect, meaning-making is a psychological and social activity fundamentally akin to other cognitive processes. The perceiver is not a passive receiver of data but an active mobilizer of structures and processes (either "hard-wired" or learned) which enable her to search for information relevant to the task and data at hand. (p. 3)

For the establishment of my taxonomy, my main reference points will be meaning-making methods of older media, particularly comics, painting, photography, film, and animation. I will create a context by describing the comparability of painting, comics,

photography, and film-animation in order to explain digital media's potential to remediate a large set of conventions established in previous media.

Bolter and Grusin (2000) define remediation as "the representation of one medium in another" (p. 45). The remediation process functions in two ways. Newer media revisit, adapt, and transform the conventions of the former media. In parallel, the older media respond to the challenge offered by new media and reformulate conventions by incorporating elements from the newer media. However, it would be impossible to separate the development of painting, performance, dance, architecture, and sculpture from one another and put them in order since their emergence belongs to pre-historic times. However, we can sequence the emergence of comics, photography, film-animation, and digital media and track the remediation of conventions more clearly among them. In this study, I survey conventions from comics, photography, film-animation, and performance that have been employed in digital-interactive performances, and identify the ways in which these conventions are redefined in digital media.

It is easier to exchange conventions among painting, comics, photography, and to a certain degree, film-animation, since all these media are based on a two-dimensional representation scale and include the frame component. Performance, dance, architecture, and sculpture have a three-dimensional representation scale and they do not necessarily contain the frame component, although they all define a space in which they operate. Prior to the advent of digital media, the medium of film had the potential of rendering all art forms. For example, any mainstream movie is a combination of architecture, music, choreography, acting, literature, and photography. However, digital media can render previous media forms without reducing them to a two-dimensional image. Considering

the expansion of representational formats, including virtual reality, ubiquitous computing, augmented reality, wearable computing, and tangible computing, digital media has an enormous potential to revisit, adapt, and transform the conventions of prior media.

In the following chapters, I will explore the impact of digital media on film, comics, and performance art, and then establish an inventory of conventions that form a legacy for full-body interactive installations. In Chapter 10, *Embodied Comics: Egg's Journey*, I will illustrate the use of possible meaning-making methods that I have established in the earlier chapters by applying them to my installation.

CHAPTER 3

EARLY IMPACT OF DIGITAL MEDIA ON FILM

3.1. Introduction

The components of the medium of digital film are different from those of analog film. These differences in camera, film strip and video tape, editing and postproduction, and distribution are radically changing the film grammar and the established conventions of narrative film. Moreover, contemporary cinema is reacting to the participatory qualities of such emerging digital storytelling environments as games and tangible installations. The inclusion of technological innovations such as computers, internet, and cellular phones as diegetic elements are inevitably changing the cause and effect relationships in a plot. I will make an overview of the consequences of these changes and I will illustrate them with examples.

In this chapter, the terms “traditional or analog film” indicate 35mm film footage such as *The Birds* (1963) projected in a movie theater. The phrases “digital video and film” refer to non-interactive movies captured or simulated via digital technology such as *Timecode* (2000), projected on a screen without including interactive DVD technology. I will refer to the storytelling cases that diverge from traditional the film-viewing experience as “ubiquitous computing,” “augmented reality,” “wearable computing,” or “tangible computing” as appropriate. Numerous contemporary movies are composites of analog and digital media. I acknowledge that filmmaking is in a transition from analog to digital and this transition is not complete.

3.2. Lack of Camera and Small Camera

While moving from analog to digital, the differences in the components of the film medium include the camera and film technology, size and cost, the disappearance of the chemical development process, and the advent of non-linear editing. A digital camera can be smaller and cheaper than a traditional camera. In the case of digital animation, there is not even a camera involved in the filmmaking process. There have been analog animations made without a camera by scratching the film surface such as *Begone Dull Care* (1949). However, realistic images can be rendered without using an actual camera only in a digital environment. Bordwell and Thompson (2005) defines mobile framing as "within the image, the framing of the object changes. The mobile frame thus produces changes of camera angle, level, height, or distance *during* the shot" (p. 266). The miniaturization or absence of the camera gives a greater freedom to create a mobile frame. Almost all CGI-based Pixar and Disney productions use this potential for freedom of movement in an intense and emphatic way. *Toy Story I-II* (1995), *A Bug's Life* (1998), *Shrek* (2001), *Monsters Inc*. (2001), *Ice Age* (2002), *Finding Nemo* (2003), *The Incredibles* (2004), and *Cars* (2006) each contain a longer-than-five-minute high-speed chase scene in which the virtual speedy camera runs after the characters by floating on the air. In most cases, there is an illusion of the existence of a real physical camera. In the door factory scene of *Monsters Inc.* (2001), the rails that doors and characters slide upon function as a structure for the virtual dolly camera as if a dolly camera were actually being used. In *The Incredibles* (2004) or *Shrek* (2001), the leaves of the plants in the forest hit the lens of the virtual camera while it chases the characters. The newer medium,

CGI, tends to use the previous medium's limitations and conventions in order to create verisimilitude.

A small digital camera can be placed in unexpected locations and it can supply extreme camera angles. In the case of CGI animation it can be implemented in more awkward locations such as inside the bronchioles of a character in *Magnolia* (1999). In the traditional film medium, these extreme camera movements and angles are potentially self-conscious since they remind us of the presence of a camera, a component of the medium. However, in digital filmmaking, as extreme angles and movements are frequently employed, these uses become part of the conventions and are not necessarily self-conscious. In fact, the film narration becomes more self-conscious when the director limits the digital camera to traditional camera positions.

In the move from analog to digital filmmaking, the lack of profilmic reality creates the most significant impact. Since in a digital-simulation environment, there is no real camera, there is also no need to have a real object in front of the camera. However, analog film relies on profilmic reality: it cannot exist without an object in front of the camera. As Cubitt (2000) says, referring Margaret Morse's definition, "the 'virtual' image is meant to shape or invent the world, not to represent it" (p. 90). The plasticity of the digital image is enormous in comparison to that of an image captured on an analog film frame. Bordwell (2005) explains the composition of an image in analog film:

> On a black-and-white film strip the emulsion contains grains of silver halide. When light reflecting from a scene strikes them, it triggers a chemical reaction that makes the crystals cluster into tiny specks. Billions of these specks are

> formed on each frame of exposed film. Taken together, these specks form a latent image which corresponds to the areas of light and dark in the scene filmed. (p. 5)

There is no certain unit for an analog film because the borders of a grain of silver halide are not clearly defined. In contrast, the unit of a digital representation on a screen is a pixel and it is discrete. A grain of silver halide cannot be manipulated directly, but a pixel is easily manipulated. Hoffer (1989) states,

> For the live action film maker, the single shot is the basic unit of film structure. The single shot, of course, has dozens of compositional elements that work to convey meaning to the audience. But animation's range of manipulation extends far beyond the single shot. (p. 60)

Analog film is produced shot by shot with occasional post-production frame by frame. Analog animation is truly frame by frame. Whether an object is drawn on paper or on a computer screen, the act is painting. The computer makes all of filmmaking as plastic as animation. Manovich (2001) states "[c]inema becomes a particular branch of painting–painting in time. No longer a kino-eye, but kino-brush" (p. 308). In relation to Manovich's statement, color correction, copy and paste, and the use of transformations bring the medium of film to a stance closer to animation and painting. For example, the use of the copy and paste feature is evident in the following examples of contemporary mainstream American cinema: *Matrix Revolutions* (2003), with the use of Agent Smith and his duplicates, and of the octopus shaped drill machines that penetrate Zion; *The Lord of the Rings: The Fellowship of the Ring* (2001) and *Terminator 3: Rise of the Machines* (2003), with armies that consist of endless rows of soldiers; and *Being John Malkovich* (2000), with numerous John Malkovich(es) entering his own "portal." The

repetitive use of the same image recalls Baudrillard's (1983) claim of the blurring relationship between image and reality. The existence of multiple perfect copies invokes the fourth level in Baudrillard's (1983) theory, where image bears no relation to any reality whatsoever: it is its own pure simulacrum.

3.3. Blurring Film Studies Terminology

The manipulability of the pixel, frequent use of color correction, and typographic and graphic components challenge the current film studies terminology, particularly the diegetic and non-diegetic distinction. This challenge signals the need for a novel theoretical approach for digital media. In traditional film, color manipulations are achieved by using color filters. Color filters offer a monochromatic color scale. This solidity makes its effect easier to categorize. For example, in *Chinatown* (1974), the sepia color scale is simply non-diegetic. It is there for the audience, and not for the characters of the story world. However, it is not easy to make the same claim in *Le Fabuleux destin d'Amélie Poulain* (2001), since the pastel color scale created by digital manipulation in this movie is more complicated than the color scale offered by a color filter. The organic involvement of the typographic and graphic components challenges the diegetic and non-diegetic distinction in a similar way. In analog movies such as *Double Indemnity* (1944), the title of the movie appears in plain letters and it is easy to identify the letters as a non-diegetic element. In the opening of *Run Lola Run* (1998), the camera rises to the bird's eye view; the characters of the movie get as tiny as ants and the characters form the title of the movie, "Run Lola Run." Whether this title is diegetic or non-diegetic is a complex discussion and the terms diegetic and non-diegetic are not sufficient for this discussion.

3.4. Shift to Animation

The consequences of the shift from analog film to digital are related to the shift from live action to animation. Elsaeser (1998) indicates the resemblance between today's spectacle action movies and Melies's approach in the early days of cinema. First of all, the qualities of animation are reflected in characters who can take unlimited pain in most contemporary action thrillers. The violent acts of the action heroes of *Minority Report* (2002), *The Matrix* (1999), *Sin City* (2005), and *V for Vendetta* (2005), create no real harm to the heroes' bodies, as if they are unbreakable animation heroes made of paint and ink. Second, in many fight scenes, the actors' bodies are tied with wires, which are erased in post production. (or not visible because chroma-keyed). Consequently, actors seem to act independently of gravity and against the laws of physics, just like animation heroes. Actors who are tied with wires from the top resemble marionettes. Creed (2000) points out another dimension, the merging of animated and real actors. In order to get an NC-17 rating in the US prints, the orgy scene in *Eyes Wide Shut* (1999) has been digitally altered. "A group of men in cloaks, accompanied by two naked women, arms linked, stroll in front of the camera." However, "the figures are not 'real': that is, they have been digitally generated on computer" (p. 79). This is particularly ironic – because the digital is being used to mask desire represented in the analog film.

3.5. Rise of the Casual Look

The emergence of virtual and miniaturized camera, the loss of profilmic reality, and the low cost of a digital camera and digital video tape validate Laszlo Moholy-Nagy's (1947) very early insight: "The illiterate of the future will be a person ignorant of the use of the camera as well as the pen" (p. 209). Since a cheap-small-digital camera

functions like a pen for sketch-like note taking, the use of digital cameras supports the casual look in filmmaking. By referring to shooting on location, with available light and portable equipment, Bordwell (2005) defines the casual look in the context of The French New Wave. “The most obviously revolutionary quality of the New Wave films was their casual look. To proponents of the carefully polished French *cinema quality*, the young directors must have seemed hopelessly sloppy” (p. 487). This causal aesthetic is close to the documentary and experimental film aesthetic. The tendency towards the casual aesthetic in digital film resembles the qualities of French New Wave. The casual look in contemporary digital films includes an unstable, shaky camera, lack of focus, camera light in the frame, the recording of the voice of the cameraman, natural sound, natural lighting, casual costumes, obstructions in the frame, discontinuity editing, and jump cuts such as in *Sex, Lies, and Videotape* (1989), *To Die For* (1995), *Blair Witch Project* (1999), *American Beauty* (1999), *The Million Dollar Hotel* (2000), *Dancer in the Dark* (2000), *The Ring* (2002), and *Rachel Getting Married* (2008).

3.6. New Special Effects Created with Small-Cheap Cameras

The lower cost of the digital video camera has also motivated the inventions of new special effect tricks based on the use of numerous cameras such as the 360° turn in *The Matrix* (1999). Directors locate multiple cameras in high-budget, hard-to-repeat action scenes in *Frida* (2002), *Dancer in the Dark* (2000), *Bamboozled* (2000), *Gladiator* (2000) and benefit from the multi-takes in a single production event.

3.7. Experiments on Long Take

The lack of chemical development process and the smallness of a digital tape and a DVD in comparison to a film reel also reduce the production and distribution costs and

supply a greater flexibility for long takes. For example, a 35mm film reel can record at most 11 minutes without a cut while a digital video tape can record up to 120 minutes. Hitchcock, in *Rope* (1948), experimented with the limitation of the long take in analog film medium by recording as long as he could on a film reel without having a cut. *Rope* is 88 minutes long and it contains only 7 obligatory cuts. In *Timecode* (2000) Mike Figgis made a similar experiment with digital video by recording the same story from four different points of view. Each point of view is 98 minutes long and each consists of only one long take. He used four split screens so that each point of view can be seen at the same time in each frame.

3.8. Impact of Non-linear Editing: Blurring Space-Time Unity

In opposition to the expanding freedom of the long take in digital video, the main tendency in contemporary cinema appears as short, rapid cuts as a consequence of non-linear editing. Extending Bazin's arguments, Giannetti (1990) claims that "the essence of cinema […] is the cut" (p. 113). If the cut is the essence of cinema then the impact of non-linear editing on the contemporary cinema is absolutely transformative. Each cut in film allows viewers to use their mental participation in order to obtain closure for constructing the meaning. The increased pace of editing brings two main consequences: over-fragmentation of time and space and an emphasis on orientation to help viewers find their way in this over-fragmented world.

In addition to the use of non-linear editing tools, the fragmentation of space and time in cinema is also caused by the influence of the music video form. Manovich (2001) suggests that the genre of music video "has served as a laboratory for exploring numerous new possibilities of manipulating photographic images made possible by computers—the

numerous points that exist in the space between the 2-D and the 3-D, cinematography and painting, photographic realism and collage" (p. 311). The music video form emphasizes nonnarrative representation and provides increased space for experimentation in creating spectacles.

The music video director Michael Gondry's feature movie *Eternal Sunshine of the Spotless Mind* (2006) illustrates the influence of the music video form on contemporary narrative filmmaking with its fragmented space and time representation. Arnheim (1974) states, "Visual identity is not problematic as long as the object remains in the same place and does not alter its appearance--for example, when a film camera without changing its location, takes a shot of a building" (p. 392). Violations of Hollywood continuity editing have actually been used for decades to represent disturbed states of mind, as exemplified by Hitchcock's representation of Scottie Ferguson's confused mental state in *Vertigo* (1958). In digital environments, the confusions of visual identity and of space/time orientation become tools of narration. In *Eternal Sunshine of the Spotless Mind* (2006), the multiplicity of the images blurs the space-time unity. For example, after having a lovers' quarrel, Joel chases Clementine and drives his car into a fire hydrant. He leaves his crushed car on the right side of the frame and he runs to the left side of the frame. His crushed car, still next to the fire hydrant, meets him on the left side. His car can simultaneously coexist in two different places. This continuity-conflict is meant to represent the unprofessionally processed memory erasure procedure which fragments time and space in an irrational way. The anachronisms and the absurd assumptions also contribute to the fragmentation of time and space. Even though the story takes place in the late 1990's, the memory erasure and file storage are done by analog-looking primitive

media devices such as a machine that resembles a hair dryer from the 70's. Patients' records are kept in paper folders and on cassette tapes; the memory-erasure team uses a TV screen at Joel's house instead of a computer monitor. In this fragmented world, the movie offers small signposts to the viewers as reference points. For example, a set of physical marks, including the mark of a ball point pen on Joel's head, bruises on Clementine's buttock, and the dents on Joel's car help viewers to navigate the time scheme and construct coherent cause and effect relationships. In Chatman's (1980) and Bordwell's (1993) taxonomies, plot time refers to the duration of the movie while story time refers to the viewer's construction of time in their minds. For example, in *2001: A Space Odyssey* (1968), the plot time refers to actual duration of the movie, 141 minutes. However the story takes place in approximately 3.5 million years. Construction of the story time requires viewer's mental participation. In a non-linear and fragmented narration, the viewers need signposts to construct a coherent story time.

Similar kinds of anachronisms are present in *Minority Report* (2002) as well as in *The Matrix Trilogy* (1999, 2003, 2003). In *Matrix* (1999), the old primitive spiral cabled phones supply the transition between the matrix and the real world. Morpheus, Trinity and Neo wear leather coats. In *Minority Report* (2002), the present time is 2054. However, the precogs foresee the murders by activating a chance ball system. The murderers' and the victims' names appear on an almost primitive wooden chance ball in the year 2054. About the murder weapons in *Minority Report* (2002), James (2002) ironically states, "[k]illings in 2054 are performed in resolutely arcane ways such as stabbing, strangulation, drowning or even shooting with an automatic pistol" (p. 13). In these cases, visuality is more important than logical or temporal inconsistencies with the

use of props. In contemporary action thrillers which rely on digital special effects, everything is possible as it is in the animation genre. There is no need to define consistent paradigms in order to explain weird events or create verisimilitude. The inconsistencies in *Eternal Sunshine of Spotless Mind* (2006), *Minority Report* (2002), and *Matrix Trilogy* (1999, 2003, 2003) do not make these movies incoherent, but rather support their closer stance to animation and its lack of profilmic reality. In addition, intentional anachronisms contribute to the thematic fragmentation of space and time.

3.9. Pseudo-Interactivity

The film medium offers only mental and emotional participation to its viewers. The film audience cannot change the film. The viewers of film are passive as Hitchcock suggested in *Rear Window* (1954). Jeff with his broken leg on his wheel chair can only watch his neighbors and cannot interact with them, mirroring the stability and the passiveness of the audience sitting in the movie theater. The emerging digital interactive storytelling environments offer a participatory quality in contrast to the stability of film. The film medium has responded by appropriating the narration tools of digital games. Since the film medium is fundamentally static it exhibits a pseudo-interactivity, creating different viewing experiences with the bombardment of images, via fast editing and split screens, and enhancing the identification process by plunging into the human mind. Moreover, as a response to the replay quality of games, contemporary movies may include multiple endings and encourage repeat viewing with puzzle-like story and plots such as *Memento* (2000) and *Eternal Sunshine of the Spotless Mind* (2006).

The use of fast editing and split screens create a purposefully overwhelming bombardment of images in *25th Hour* (2002), *Time Code* (2002), *Fight Club* (1999),

Snatch (2000), *The Matrix Revolutions* (2003), *V for Vendeta* (2005), and *SinCity* (2005). In these movies, viewers can perceive some of the visual information, but not all of it. Consequently, each viewing experience will be different from the previous ones. For example in *Timecode* (2000), viewers cannot pay attention to all of the four frames at the same time. In each viewing, they make their own editing with their eyes. Even though the actual movie never changes, their perception of the movie differs in each viewing. Since the interaction is one-sided, only in the mind of the viewers, fast editing and the split screen serve to create pseudo-interactivity.

With the digital games' participatory quality, players can "be" the character or take the character's point of view while manipulating the actions--especially in Virtual Reality based applications. In reaction to games and virtual reality environments, contemporary film shows a tendency to enhance the identification process by plunging into the human mind, as in *Total Recall* (1990), *Johnny Mnemonic* (1995), *Strange Days* (1995), *Contact* (1997), *Darkcity* (1998), *Fight Club* (1999), *ExistenZ* (1999), *The Matrix* (1999), *Being John Malkovich* (2000), *The Cell* (2000), *Vanilla Sky* (2001), *Swimming Pool* (2003), *Mullholland Drive* (2002), *The Matrix Reloaded* (2003), and *The Matrix Revolutions* (2003), and *Eternal Sunshine of the Spotless Mind* (2006).

Parallel to the opportunity to replay in computer games, numerous contemporary films encourage multi-viewing and many have multiple endings. Spielberg uses multiple endings almost like a formula. Both *Artificial Intelligence: AI* (2001) and *Minority Report* (2002) contain one dark ending followed by a happy ending. Even though the movie never changes, audiences make a selection in their minds depending on their preference. The story design of *Eternal Sunshine of the Spotless Mind* (2006) also

encourages a multi-viewing activity. The movie opens up with the meeting of Joel and Clementine without revealing the fact that they have already met, fallen in love, split up and do not remember any of it because they have had their memories erased. When viewers learn this fact at the end, the meaning of each scene drastically changes. In addition to this, the shuffled order of the events and their distorted presentation because of the memory erasure process also encourages multi-viewing. *Fight Club* (1999), *Mulholland Dr.* (2001), and *The Sixth Sense* (1999) also provoke a kind of re-viewing by relying on a similar strategy.

3.10. Conclusion

The impact of digital medium on film is immense and this impact will affect the meaning-making methods of Embodied Comics in the following ways:

1. In digital film, the absence of a camera and the advent of small cameras increased mobility and introduced extreme camera angles. An Embodied Comics environment can benefit from the mobility and extreme camera angles by establishing “impossible” story worlds such as the inside of a human body.

2. The plasticity of digital image blurs the existing film studies terminology and creates the need for defining novel terms for the discussion of more complex cases. The cases regarding immersion and alienation in an Embodied Comics environment cannot be explained with existing film studies terminology.

3. The absence of profilmic reality in digital imaging increases the plasticity of the frame. The digital film adapts the conventions of animation genre because of this increased plasticity. Since digital media allow the procedural manipulation of the image, computer-vision-based environments can also benefit from this plasticity.

4. The low cost and availability of digital film equipment lead to the rise of the casual look. Many computer-vision-based installations enable participants to interact wearing simply their daily apparel.

5. In digital filmmaking, the low cost and miniaturized cameras motivate the creation of new special effects. The low cost of webcams allows artists to utilize numerous webcams in computer-vision-based environments.

6. The low cost of video tape and its compactness encourages experimentations with long takes. In computer-vision-based environments, there is no limit on the duration of the take.

7. In digital filmmaking, the advent of non-linear editing motivates the fragmentation of space-time unity. The procedurality of digital media increases the digital artist's intentionality and control of editing. Full-body interactive installations can convey narrations based on gags and episodes that occur non-linearly.

8. Full-body interactive installations are creating a response in film narration. The fundamentally stabile film medium responds to interactive narrations and computer games by exhibiting pseudo-interactivity.

The digital medium has impacted comics as it impacted film. In the next chapter I will create a taxonomy explaining this impact.

CHAPTER 4

EARLY IMPACT OF DIGITAL MEDIA ON COMICS

4.1. Introduction

The comics medium's ongoing transition from printed page to the computer screen has generated a set of new categorizations including digital comics, Web (internet-online) comics, hybrid comics, and interactive comics. There are no clear-cut definitions of these categories in the literature except those of Scott McCloud in his *Reinventing Comics*. McCloud (2000) broadly defines digital comics as "comics that exists as pure information" whereas "online comics are all digital comics in a technical sense but many are still no more than 'repurposed' print at heart" (p. 203).

A traditional comic (see Figure 4.1.1) is a comic produced with conventional methods such as drawing on paper with pencil and ink. A digital comic can be produced and distributed both digitally and traditionally. To be able to categorize a comic as a digital comic it should be produced or distributed digitally. Web (internet or online) comics and hybrid comics are sub-categories of digital comics. Online comics are comics published on the internet. In the production or distribution of a hybrid comic, digital and traditional methods are employed together. Most Web comics are hybrid comics. They are produced with paper and pen, scanned, painted digitally, and published online. An interactive comic does not have to be a digital comic. For example, a fold-in (see Figure 4.1.2) is an interactive comic but not necessarily digital. In an interactive comic, the reader can manipulate the images or the plot.

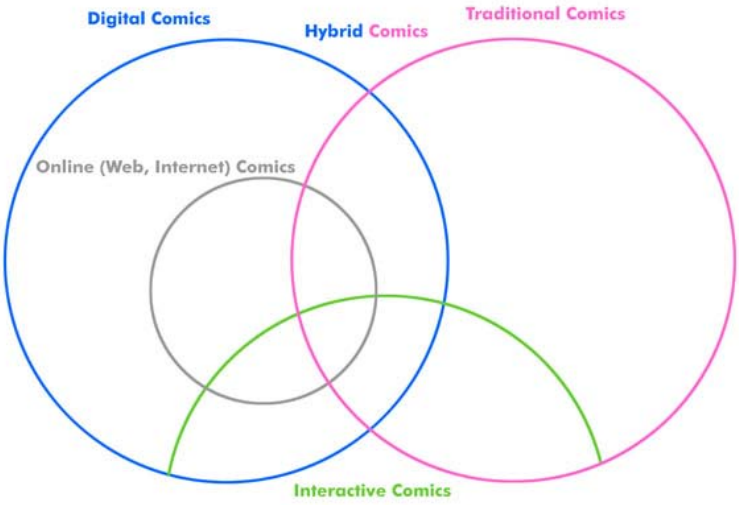

Figure 4.1.1 Definitions

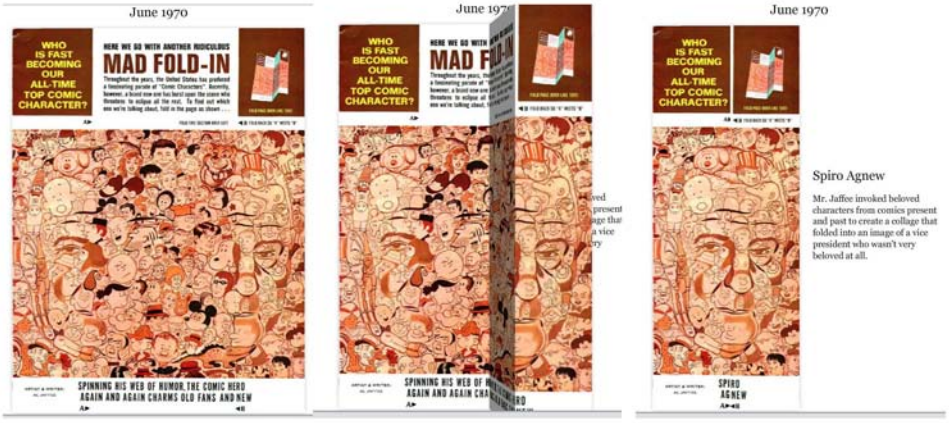

Figure 4.1.2 A fold-in is an example of a traditional and interactive comic, http://www.nytimes.com/interactive/2008/03/28/arts/20080330_FOLD_IN_FEATURE.html.

In this chapter, I will make an overview of new meaning-making possibilities in current Web comics (computer screen based comics) by illustrating them with examples. Some of the examples covered in this section are not pure Web comics but combinations of comics, interactive animation, and games. Having originated in print, the comics

medium has moved to the computer screen in the digital era. The comics medium will continue to evolve in full-body interactive environments. A survey of Web comics is necessary to understand Embodied Comics as one possible path that digital comics will be taking in the near future.

4.2. Movement in Web Comics: Comics or Animation

Print comics are motionless. The sense of movement is implied with the convention of the movement lines. Unlike traditional comics, an online comic can include animation and audio. The use of audio and motion in a comics narration triggers the question of how one decides if it is still comics or animation. Regarding the inclusion of movement in Web comics, as Bukatman (2002) claims:

> The lateral, bounded and looping animations that constitute a weakened version of the kind of moving image most familiar to students of film and video study do not *take* us anywhere, but only return us, repeatedly, to an initial state (and stasis). These small, limited movements are a far cry from the real time immersion of cinema or their close analogue, computer games, and are a far less definitive world of being. (p. 142)

The use of animation in a comics story does not necessarily make the narration animation-like, as we will see in the following examples. These examples explore four strategies for interactivity: a small part of the still frame contains a small looping animation; the contents of the frame is motionless unless there is user interaction; the animation creates invisible frames or smooth transitions between these motionless frames; a tiny animation in contrast to the stillness of the entire frame causes the release of a tiny gag.

4.2.1. Still Frame Contains a Small and Looping Animation

In a large still frame of a comics story, a tiny looping animated part takes the movement line convention only a step further. In Demian.5's Web comic, *When I am King*, (see Figure 4.2.1.1), everything in the three frames is motionless except the legs of the little boy being eaten by the desert animal. The animation of the repetitively flapping feet resembles a still drawing of feet surrounded with a couple of motion lines indicating the action of flapping. A tiny looping animated part does not make the comics story animation-like. Instead, such use of animation enforces the movement line and contributes to the conventions of comics.

Figure 4.2.1.1 The employment of minimalistic animation resembles the movement line convention in *When I am King*, http://www.demian5.com/king/wiak.htm.

4.2.2. Motionless Content Unless There is User Interaction

At the first glance, Han Hoogerbrugge's *Prostress 2.0* appears as an interactive animation piece. However, in *Prostress 2.0* the use of interactive animation reiterates the conventions of the comics medium rather than making the narration animation-like. In *Prostress 2.0* (see Figure 4.2.2.1), the screen shows one man in a black suit and his two smaller silhouette images consecutively stacked behind him.

Figure 4.2.2.1 Han Hoogerbrugge's *Prostress 2.0*, http://www.prostress.com/

When clicked on, the character gets smaller and moves backward while his medium-sized silhouette image grows to the central space with a different body gesture and with a new speech balloon. In *Prostress 2.0*, unless the user clicks the mouse, the content of the frame is still. Clicking the mouse brings new content to the screen and creates a sense of invisible frames. The use of interactive animation in *Prostress 2.0* for navigation purposes underlines the basic component of the comics medium, the frame, by creating invisible frames. In addition to the invisible frames, the use of still images and speech balloons brings this piece even closer in stance to the traditional comics medium.

4.2.3. Animation Creates Invisible Frames or Smooth Transitions

On the New York Times' Website, an article about a small plane's plummeting into a building in Manhattan includes an informative illustration based on eight consecutive cut scene animations (see Figure 4.2.3.1). Each mouse click initiates an animation.

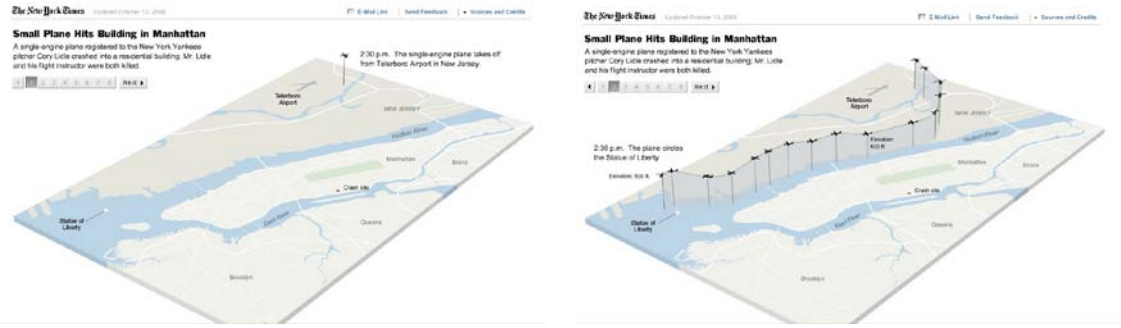

Figure 4.2.3.1: First two sections of 8 pieces, animated illustration of a plane accident, http://www.nytimes.com/packages/khtml/2006/10/11/nyregion/20061011_CRASH_GRAPHIC.html

In these animations, the plane heads for a destination; the map of Manhattan disappears; and the camera zooms in to the building. At the end of each animation, the contents of the frame become still and an informative text appears. In this case, the function of animation is to make fluid transitions between the frames. The main information is conveyed not by the animation, but by the eight still frames and the informative text accompanying them.

4.2.4. Animation in a Still Frame Creates A Gag

In Han Hoogerbrugge's *Modern Living,* there are ninety nine short looping interactive flash animations responding to the users' mouse actions. *Modern Living* does not tell a story but all the animations convey the same theme of technology and alienation. The use of interactive animation in the 96th piece titled *Summer* resembles the gag-based nature of single frame caricatures. In *Summer*, the character is motionless unless the user clicks on the mouse. When clicked on, he takes off his mask. The uncovered face is the same as the face at the beginning of the animation (see Figure 4.2.4.1) and he becomes motionless again. Regardless of how many times the user clicks on him

Figure 4.2.4.1 Han Hoogerbrugge's *Summer* in *Modern Living*, http://ml.hoogerbrugge.com/

he will never reveal his real identity. Frustratingly enough, viewers can only see his recurring masks. In a single frame, the character is motionless unless there is a mouse click. The release of a tiny gag with a single mouse click brings the piece to a stance closer to a single frame gag comic.

Consequently, as illustrated in the four previous examples the use of interactive animation in Web comics does not necessarily make the comic animation-like.

4.3. Infinite Canvas

4.3.1. Definition

In addition to the inclusion of animation and audio, the emergence of digital media affects the qualities of the canvas itself. Unlike the print medium, the digital medium offers a vast amount of space to draw on. McCloud (2000) imagines the computer monitor as a window that can be scrolled across an infinite canvas (see Figure 4.3.1.1).

Figure 4.3.1.1 Scott McCloud's infinite canvas in *Reinventing Comics* (p. 222)

4.3.2. Criticism of Infinite Canvas and Misconceptions

McCloud on his website gives examples of infinite canvas comics such as *My Obsession with Chess*, *The Carl Stories*, *Porphyria's Lover*, and *I Can't Stop Thinking*. Of course, these comics are not actually infinite; they employ a large but finite canvas that can be navigated digitally. Obviously, as McCloud illustrates, comics that use a large but finite canvas offer a vast narration potential. However, his term "infinite canvas" indicates more potential than he has achieved. Even though Scott McCloud claimed in 2000 that the infinite canvas is the essence of digital comics, in 2008, there is almost no well-known example of a comic that literally uses an infinite canvas. The sole exception is a comic that actually parodies the infinite canvas concept.

P.D. Magnus in his philosophical Web comic, titled *An Enquiry into the Infinite Potential of Webcomics,* looks at the concept of infinity from the philosophers' point of view claiming that the concept of infinite canvas "labors under an outdated conception of infinity". His comic illustrates the ease of creating an infinite number of panels but the impossibility of viewing all of them. Magnus creates an infinite canvas by portraying a scene of two monkeys: one pushing another into a bottomless pit. In the preceding panels,

the monkey keeps falling off the cliff in several different body postures (see Figure 4.3.2.1). Each click of the user randomly brings one of the five different body postures of the falling monkey to the screen. With this simple method of repetition, Magnus creates a falling scene that consists of an infinite number of panels. After clicking for a while and seeing the monkey fall down a couple of miles, a new option box appears: “click here to jump really far ahead.” When clicked on it, the monkey touches the ground safely and complains about the long falling scene. There is no meaning or pleasure seeing a monkey falling down infinitely. P.D. Magnus’ implementation, then, raises two questions: How can an artist creatively approach an infinite canvas comic? Who is going to look at all of the frames?

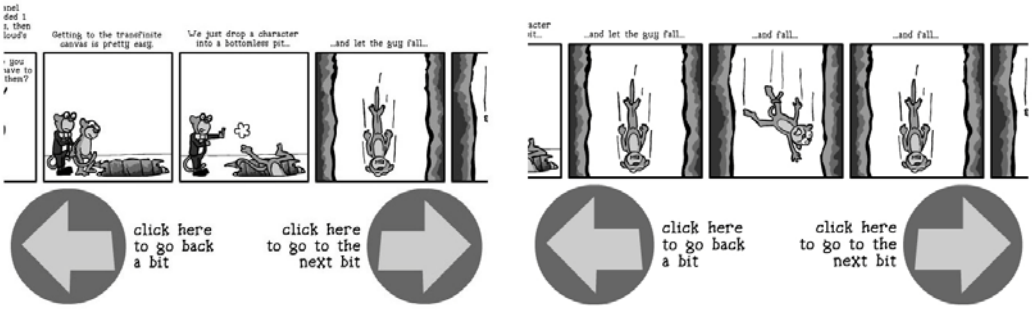

Figure 4.3.2.1 Implementation and parody of a literally infinite canvas, http://www.fecundity.com/pmagnus/canvas/

The lack of interest in the literal use of an infinite canvas is based on a set of misconceptions such as the impossibility of viewing the infinite numbers of panels, the difficulty of excessive scrolling, the difficulty of creating an infinite number of panels, and the difficulty of loading such a big file. All of these misconceptions imply the lack of procedural thinking in the digital comics field.

4.3.3. Experiments with Navigation of Large but Finite Spaces

Scott McCloud introduces the online comic creation environment, The Tarquin Engine, that he learned form Daniel Merlin Goodbrey. Tarquin Engine (a set of Flash ActionScript code for implementing branching comics stories), and the Web comics, *Pocom*, *Days in a Day*, *Never Been*, and *Meanwhile*, attempt to implement not an infinite but a large canvas by experimenting with the flexible usage of the navigable space (see Figures 4.3.3.1-4.3.3.4).

Daniel Merlin Goodbrey designed *PoCom-UK-001* with the Tarquin Engine. In *PoCom-UK-001*, a small prop in one of the alternative story branches initiates a dramatic cause and effect relationship in the main story line. Unimportant props suddenly become important and supply surprising moments in the web of branches.

Experiments with navigation of large but finite canvases are significant since this possibility enables comics artists to use the spatial quality of the digital medium. Although the navigable story space is finite and one can print these comics out on paper, the dissemination and navigation of such stories in the print medium is a big challenge.

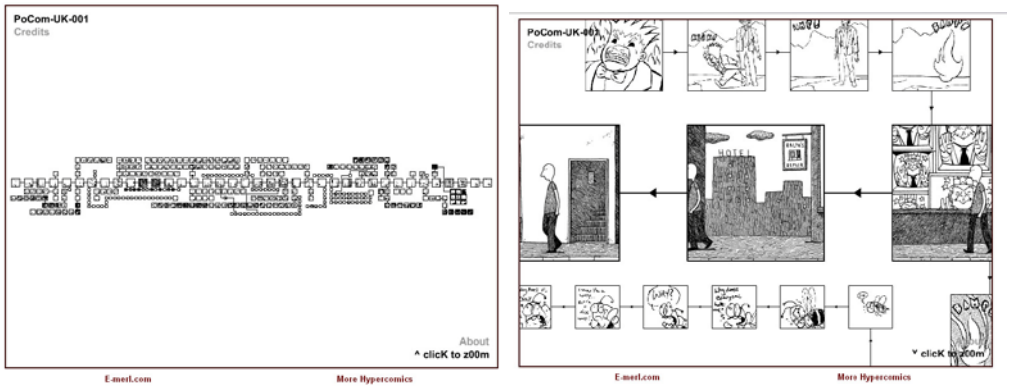

Figure 4.3.3.1 The paneling of *Pocom* designed with *Tarquin Engine*, http://e-merl.com/pocom.htm

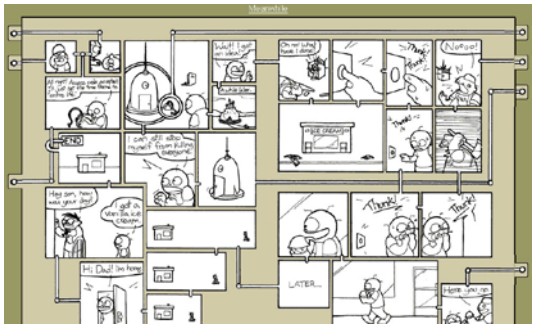

Figure 4.3.3.2 Paneling of *Meanwhile*, http://www.shigabooks.com/interactive/meanwhile/01.html

Figure 4.3.3.3 Paneling of *Days in a Day*, http://www.daysinaday.com/

Figure 4.3.3.4 Paneling of *Never Been*, http://www.stuartkolakovic.co.uk/neverbeen.htm

Creating a canvas that is literally infinite expands the meaning-making possibilities that a large but finite canvas offers. In order to create such a canvas, the procedural quality of the digital medium needs to be employed. The following two

examples, while not pure digital comics, are quite helpful in revealing the unexplored narrative potential of an infinite canvas for digital comics.

4.3.4. The Infinite Canvas as a Single Vertical Frame

On planetdan.net the screen saver *Falling Bush* represents a puppet version of George Bush continuously falling down (See Figure 4.3.4.1). This application combines comics, interactive animation, and an aimless game. When the puppet hits the balloons, his boneless body bounces, slides, and turns a somersault on the balloons until he finds a downward path.

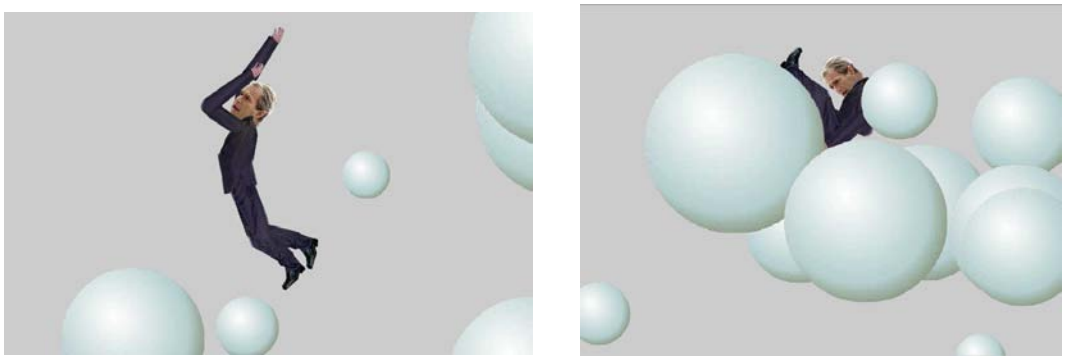

Figure 4.3.4.1 Falling Bush: Procedurally generated infinite canvas, http://www.planetdan.net/pics/misc/georgie.htm

Once Puppet Bush is caught between the balloons, the contents of the screen freeze until the user drags and releases Puppet Bush to a free zone where he will keep descending. The application includes three significant qualities of a single-frame comic. First, the frequent jam-ups cause stillness in the frame. Secondly, the infinite canvas appears as a single vertical frame similar to single-frame comics. Finally, the piece has the iconoclastic quality of single-frame political cartoons, which often undermine the authority of political figures by placing them in absurd, vulnerable, and undignified situations. In this case, users have the agency to twist and bend Bush's body cruelly.

Moreover, he continuously falls down, hitting his body on the obstacles he encounters while keeping a silly smile on his face. Obviously, Planet.com's iconoclastic approach serves a commercial purpose rather than serving artistic expression or political activism, since it does not have a political point of view. In addition to Puppet Bush, the application, surrounded by Google ads, includes the options of substituting Puppet Obama, Palin, Hillary, and even Naked Hillary.

4.3.5. A Collaborative Infinite Canvas Idea: Navigation with Coordinates

A second example of an attempt to represent the concept of a literally infinite canvas is *GraffyWall-WebCanvas*, a world-wide collaborative painting project (see Figure 4.3.5.1).

Figure 4.3.5.1 *GraffyWall*: infinite canvas implemented for painting, http://webcanvas.com.

Although *GraffyWall* is an example of digital graffiti or painting rather than a digital comic, it suggests the possibility be a collaborative comics project utilizing digital technology in this way. In *GraffyWall*, the users can upload images or draw directly onto the infinite wall. Users can add their drawings by clicking on the link "last active" zone or by writing the coordinates of the spot on which they would like to post their creations, i.e., "2 North, 3 West". As the numbers for the coordinates increase, for example 2007

North, 9817 West, the possibility of finding a adjacent blank zone increases. In the active zones, users can watch other people posting their images. The new images keep coming to the screen when "watch others" mode is enabled. *GraffyWall* exemplifies novel, other-than-scrolling navigation possibilities correcting the misconception that an infinite canvas is difficult to create, load, and navigate.

4.3.6. An Unexplored Possibility: Geotagging

In addition to *GraffyWall*, the current geotagging technology points to the possibility of using the entire surface of the world as a canvas for digital comics. Although there is no example of an infinite canvas comic that uses geotagging, existing photograph posting and spatial navigation applications are helpful in providing inspiration and ideas for similar uses for comics narration. For example, *Microsoft Pro Photo Tools 2* enables users to geotag and pin their photographs onto a map, linked to the exact location where the photographs were taken. *Google Street View* does not let the users post photographs but enables them to zoom in to a certain spot by writing the street address and then spatially navigating the photographs of the neighborhood. Noah Snavely and Steve Seitz's (2006) research, Photo Tourism: Exploring Photo Collections in 3D is also a way of composing a whole by combining photographs of the same location taken from different points of views by different people at various times (see Figure 4.3.6.1). All these spatial photo sharing-navigating-composing examples point out potential directions that infinite canvas comics may take.

Figure 4.3.6.1 Photo Tourism: Exploring Photo Collections in 3D, http://phototour.cs.washington.edu/

A collaborative comics project might make use of similar applications. For example, on SketchCrawl.com people who enjoy drawing get organized on the forum pages and they make sketches of the same neighborhood on the same day. Contributors post their sketches on the forum pages with a caption or a story. A collaborative sketching project such as Sketch Crawl can be exhibited on a spatially navigable infinite or finite canvas. A group of people drawing different parts of Central Park, for example, or people who are sketching on a historically important day, such as President Obama's Inauguration, can post their sketches to spatially navigable infinite or finite canvases.

4.4. Digital Comics' Remediation of Filmic Navigation Techniques

The majority of Web comics do not use the procedural and encyclopedic qualities of the digital medium for developing original navigation techniques for either a limited but large canvas or for an infinite canvas. Web comics using a substantial but limited canvas have developed further navigation solutions inherited from film narration (zoom-ins, 360 degree scrolling, the imitation of a multiplane camera, fade-in and fade-out) and

from computer games (creating a puzzle in which the user has to discover where to click). The following examples from *The Formalist, Makibishi Comic, Dead on Arrival,* and *When I am a King* illustrate digital comics' remediation of filmic navigation techniques.

4.4.1. Zoom-ins and Zoom-outs

In Daniel Merlin Goodbrey's *The Formalist* (see Figure 4.4.1.1), which is a formalist experiment rather than a story told with comics, the user moves through the z-axis and crawls into the narration with zoom-ins. The characters with box-heads make open ended philosophical statements.

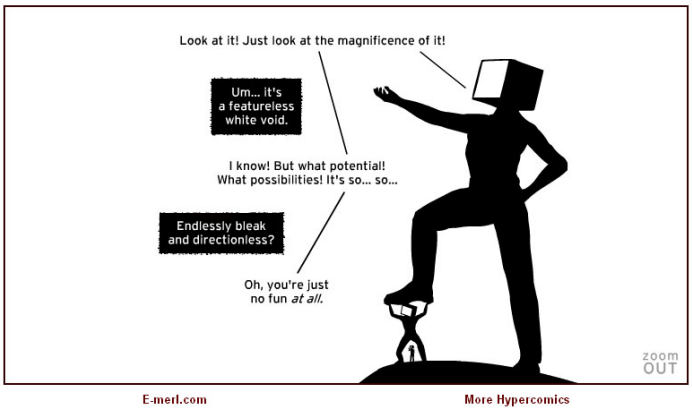

Figure 4.4.1.1 Navigation with zoom-ins and zoom-outs in *The Formalist*, http://e-merl.com/form.htm

Scott McCloud experiments with a zooming format in his Web comic *The Right Number,* a three part graphic novella.

Figure 4.4.1.2 Navigation with zoom-in and rotation in *The Right Number*, http://www.scottmccloud.com/1-webcomics/trn/index.html

Figure 4.4.1.3 Navigation with zoom-in and rotation in *The Right Number*, http://www.scottmccloud.com/1-webcomics/trn/index.html

Figure 4.4.1.4 Navigation with zoom-in and rotation in *The Right Number, http://www.scottmccloud.com/1-webcomics/trn/index.html*

The protagonist of the story is a mathematician. He looks for the right women by obsessively exploring the correlation between the numeric structures of phone numbers and coincidence of meeting a particular woman. After a short while, each of his relationships with women becomes monotonous since he is emotionally inaccessible. He refuses to see his shortcomings and repeats the same pattern. As soon the protagonist's relationship becomes monotonous, he starts thinking about connecting with the next women who has the next phone number. The zooming format successfully narrates the repetitive pattern of his behavior, increases readers' identification with the protagonist, and draws them deeper into the story world. Meanwhile the protagonist is obsessively investigating the correlation between the phone numbers, the coincidences, and the

women. Each frame contains a small version of the next frame. Since that small inner frame is not in the diegetic world, it creates a slight alienation (see Figure 4.4.1.2).

Mc Cloud's most significant use of zooming appears when he simultaneously rotates the frame with a zoom-in action to demonstrate the power of one of the protagonist's woman. Her dominance is illustrated in a love-making scene, first, by showing the protagonist on top of her (see Figure 4.4.1.2); rotating the inner small frame with a zoom-in action (see Figure 4.4.1.3); and portraying her on top with a caption "It was her on top more often than not" (see Figure 4.4.1.4).

4.4.2. The Imitation of a Multiplane Camera

Makibishi Comic is a point-and-click flash game utilizing comics conventions such as text boxes for English subtitles, thought balloons, and movement lines. Moreover, the use of minimal and looping animation at the times when there is no user interaction enforces the movement line convention. In *Makhibishi Comic* there are six different layers sequenced in depth. The movement of the mouse leads to the movement of the layers at different speeds (see Figure 4.4.2.1). In real life, objects closer to the perceiver seem to be moving faster than objects in the distance –a phenomenon known as motion parallax. Ub Iwerks in 1933 developed the Multiplane camera for Disney Studios to create the illusion of motion parallax and the illusion of depth for traditional animation (see Figure 4.4.2.2).

Figure 4.4.2.1 *Makibishi Comic* creates the illusion of motion at a distance by using a multiplane camera with six layers. Layer 1:Grass, Layer 2 Characters, Layer 3: Tree in the center, Layer 4:Gray ground, Layer 5: Monster with a gas mask, Layer 6: Sky, http://comic.makibishi.co.jp/

Figure 4.4.2.2 At the top two people are controlling the multiplane camera. Each plane includes a different layer of the animation, http://annaswanson.com/final/disney.html.

The layers of an image are distributed to the separate planes of the camera according to their distances from the viewer. In order to create a more realistic depth illusion, they

move the image on each plane at a different speed, and photograph it frame by frame (closer to the camera, the faster the speed). *Makibishi Comic* also utilizes the classical cinematic transition techniques of characters fading out and a black screen wiping the image.

4.4.3. 360 Degree Camera Movement

In *Dead on Arrival*, photographs are combined with text boxes, speech balloons and thought balloons. In certain transition points, the user can move 360 degree around the room by dragging the mouse. A set of objects and characters reveal information in a text box (see Figure 4.4.3.1).

Figure 4.4.3.1 360 degree camera movement supplied by the mouse movement in *Dead on Arrival*, http://www.dead-on-arrival.co.uk/

4.4.4. Parallel Editing

Demian.5's *When I Am King* uses parallel editing by placing two horizontal long panels on top of one another. Users can scroll each long panel separately, producing the sense of simultaneity in the events happening at the different parts of the story world. For example, while the desert animal falls in love with the main character in the top panel, the

main character runs away from teasing children in the bottom panel after an animal has stripped him naked by eating his clothes (see Figure 4.4.1).

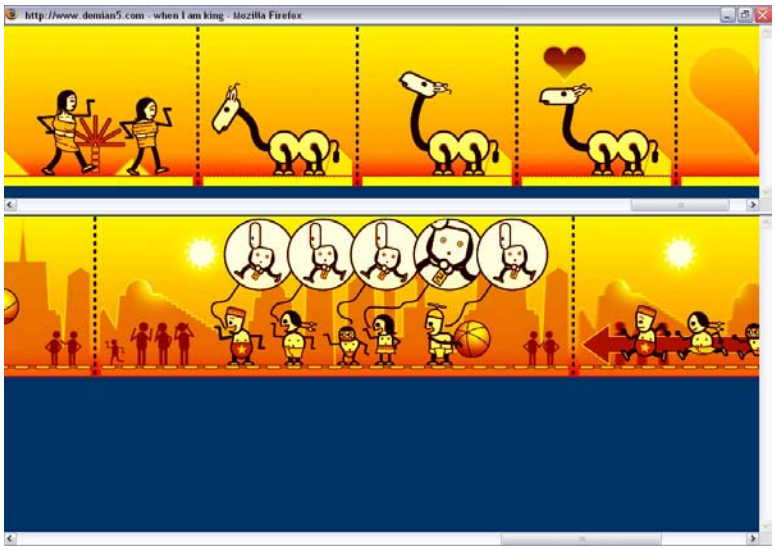

Figure 4.4.1 Creation of parallel editing with scrolling two parallel horizontal panels in *When I Am King*, http://www.demian5.com/king/wiak.htm

4.5. Dynamic and Elastic Frame

4.5.1. Elastic Borders

Digital media also influences comics narration by making the static borders of the frame elastic or by making the contents of a single frame dynamic. For example, in *Flow* there appears a tiny slit in the middle of the frame (see Figures 4.5.1.1). Each click expands the borders of the slit with a cracking sound effect (see Figure 4.5.5.1 - 4.5.1.3). As the slit gets bigger the two characters standing between the walls become visible and get closer. In addition to the expansion of the frame, each click leads to a louder cracking sound and a punch on the face of one of the characters. The meaning that the users attribute to the image of the slit changes throughout the clicking process while the meaning attributed to the cracking sound shifts from the sound of cracking walls to the

sound of a punch in the face. The elasticity of the frame borders are directly related to the shifting of meaning in *Flow*.

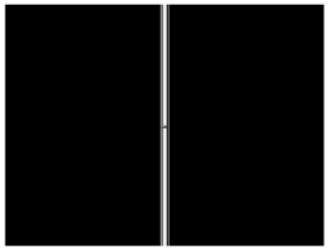

Figure 4.5.5.1 The user can expand the borders of a frame in *Flow*. Retrieved from http://download.omroep.nl/nps/dekortefilm/mixedup/flow/flow.html

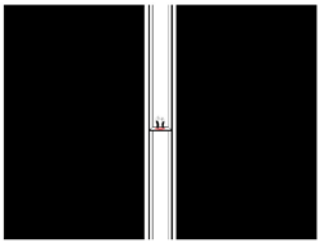

Figure 4.5.5.2 The user can expand the borders of a frame in *Flow*. Retrieved from http://download.omroep.nl/nps/dekortefilm/mixedup/flow/flow.html

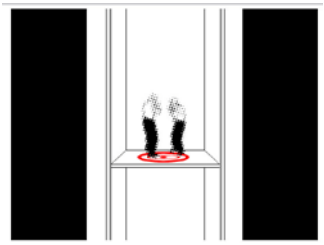

Figure 4.5.1.3 The user can expand the borders of a frame in *Flow*. Retrieved from http://download.omroep.nl/nps/dekortefilm/mixedup/flow/flow.html

4.5.2. Dynamic Content

Examples such as *Fly Guy* and, *Falling Bush* that utilize the conventions of comics, animation, and games, depend upon the frame of the computer monitor as a window for the navigation of a large or an infinite canvas (see Figures 4.5.2.1 and

4.5.2.2). In these two examples, the borders of the frame are not dynamic, although, the contents of the frame constantly change. Nevertheless, the pieces can still be categorized as comics. In *Fly Guy*, in addition to the use of speech balloons, the stillness of the main character exhibits another convention of comics. This is similar to Puppet Bush's stillness when he is squeezed between the balloons. The flying guy stays put while everything around him slowly moves unless the user navigates him. The shifting background creates the illusion of the flying guy's movement. He still looks motionless even while he is flying. In both examples, the flying guy and Puppet Bush are always at the center of the dynamic frame.

Figure 4.5.2.1 Contents of the frame constantly changes in *Falling Bush.* http://www.planetdan.net/pics/misc/georgie.htm

Figure 4.5.2.2 Contents of the frame constantly changes in *Fly Guy*, http://www.trevorvanmeter.com/flyguy.

4.5.3. Participatory Frame is Limited with Monitor

In addition to making the frame borders elastic and the contents of the frame dynamic, digital media offer a wider range of interactive possibilities for comics than the print medium can provide. Current Web comics make a limited use of the participatory qualities of digital media since current Web comics' representational qualities are trapped in a computer monitor. McCloud proposes that the infinite canvas of the digital medium will be emancipatory for the comics artist who is otherwise trapped in the limited frame of printed comics (see Figure 4.5.3.1).

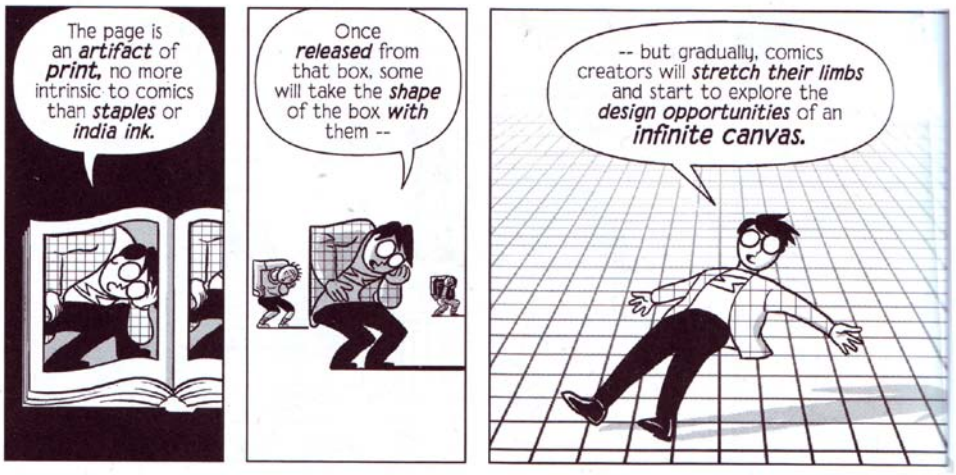

Figure 4.5.3.1 Scott McCloud's description of limitations of print medium in *Reinventing Comics* (p. 222)

Ironically, McCloud's vision of the kind of freedom that might be provided by the digital medium is limited by the computer monitor. McCloud's concept of the infinite canvas is still connected to the idea of canvas, a property of the legacy media like painting and printed comic books.

4.6. Interaction Methods Confined to the Conventions of Previous Media

The majority of interactive Web comics employ interaction methods drawn from the previous media. Currently, users can aimlessly move around a space that lacks story, play with looping animations, make decisions in branching stories, find out where to click, and solve puzzles to gain more story information. In creating participatory environments, current digital environments offer a more innovative arena for comic strips and character generation, forming communities around a Web comic, and interacting with the creator of the Web comic.

4.6.1. The Digital Comic *Meanwhile* Resembles a Printed Comic

Even though the interactive comic *Meanwhile* uses the digital environment, it benefits more from the conventions of the older print medium and does not exploit the procedural and participatory digital affordances (see Figure 4.6.1.1-4.6.1.2). It uses digital inscription, transmission, and display but it mimics the form of print comic book, except for its use of hyperlinks. The potential of the digital medium is used for two purposes in *Meanwhile*. First, electronic display reduces the physical mass of the book to screen size. Second, the readers instead of turning the pages they click on the links.

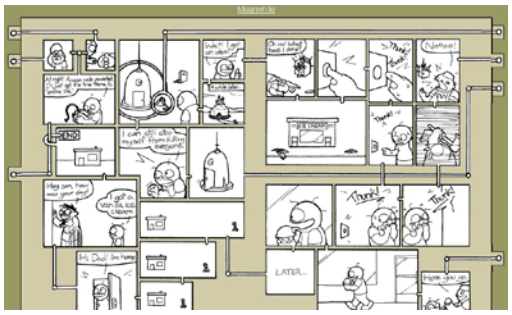

Figure 4.6.1.1 *Meanwhile* is closer to print medium's conventions, http://www.shigabooks.com/interactive/meanwhile/01.html.

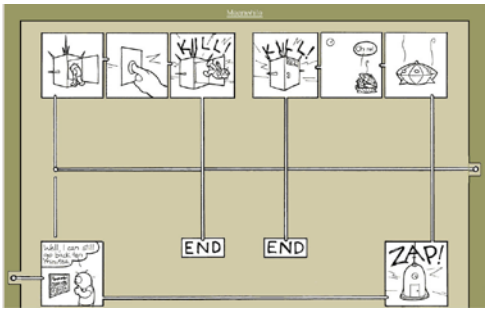

Figure 4.6.1.2 *Meanwhile* is closer to print medium's conventions, http://www.shigabooks.com/interactive/meanwhile/01.html.

The presentation of the panels as a multi-screen network highlights *Meanwhile*'s spatial qualities. *Meanwhile* explores and pushes the spatial conventions of print comics one step further. Contrary to traditional comic books, *Meanwhile* arranges the pages in a non-linear fashion. It does not only mix the order of the pages but also challenges the conventional way of reading and looking (from left to right and top to bottom). Each page contains segments of multiple tracks, so that, as its title implies, 'Meanwhile' offers simultaneous events for constructing various versions of the story. Overall, even though *Meanwhile* uses the digital medium's potential in a very narrow range, with its use of spatial representation *Meanwhile* is a remarkable example for expanding the conventions of printed comics.

4.6.2. Limited Use of the Affordances of Digital Media in *Days in a Day*

Days in a Day is an interactive narration made of flash animations and static drawings. Similar to the *Modern Living* animations, *Days in a Day* explores the theme of technology and alienation. At the opening of *Days in a Day,* a short prologue animation informs the users that the narration is going to be about imagining humans as an insect society. Then a map of an unknown city appears as the main navigation tool (see figure 4.6.2.1). The red circle-shaped markers change their color when the user clicks on them.

Once clicked on, a relevant Polaroid photo with a static drawing in it takes its place in the book (see Figure 4.6.2.2). While the users are touring the city and exploring the comics and animations embedded in the map, they construct the Polaroid-comic book. When they view the entire book, the story ends with a “Fin (The End)” title resembling a movie (see Figure 4.6.2.3).

Figure 4.6.2.1 Use of map in *Days in a Day*, http://www.daysinaday.com/

Figure 4.6.2.2 Use of book, Polaroid aesthetic and comics, http://www.daysinaday.com/

Figures 4.6.2.3 End frame of *Days in a Day* resembles film conventions, http://www.daysinaday.com/

In *Days in a Day*, the user creates the exact same book of poloroid photographs, regardless of the path in the city that she or he follows. There are no cause and effect relationships between any two locations. Spatial exploration and navigation does not contribute to the story. For example, when a user clicks on the marker near the river, an animation plays. This animation does not contain any reference to the river.

Modern Living and *Days in a Day* make a better use of the digital interactive environment than *Meanwhile*. However, none of them uses the full potential of the medium. *Modern Living* and *Days in a Day* take the easiest path and do not tell stories. None of them uses the procedural qualities of the digital medium.

4.6.3. A Creative Use of Affordances of Digital Media: *Hotel*

Hotel, an interactive tale, combines the conventions of comics, animation, and games. In *Hotel*, the conventions of comics regarding the use of text such as speech balloons, upper text box (conveying the storyteller's narration), and onomatopoeia (written sound effects) appear as projections on the walls or installations on the ground (see Figures 4.6.3.1-4.6.3.3). The interaction pattern in *Hotel* resembles a puzzle. In order to gain more textual information about the story, the user has to click on the right spots for further information. When other spots are clicked, minimalist animations portraying the concept of modern life and alienation play. These animations are irrelevant to the story line but contribute to the creation of atmosphere. Unless there is user interaction, the contents of the frame is still. The quality of stillness brings *Hotel* closer to comics narration. The visual aesthetic of the transitions with tiles and the repetitive texture of the frames also reinforce the puzzle-like interaction pattern (see Figure 34).

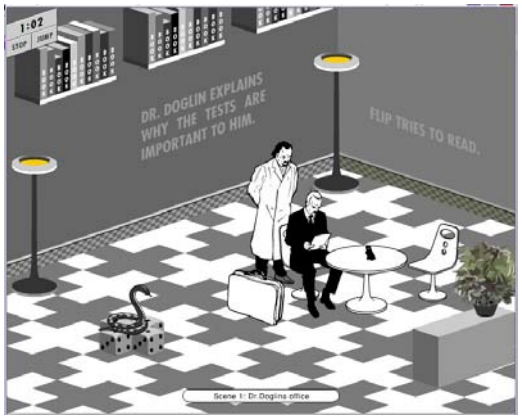

Figure 4.6.3.1 Projected text in *Hotel*, *http://www.hoteloscartangoecholima.com/splash.html*

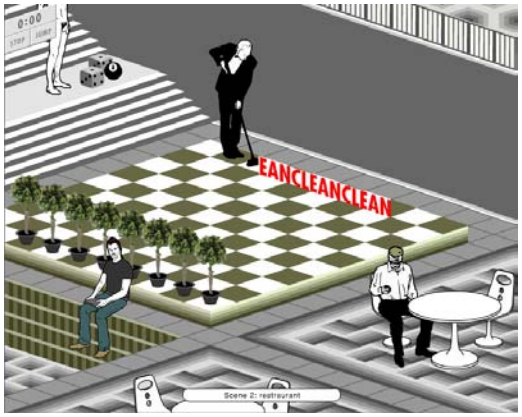

Figure 4.6.3.2 Written sound effects in *Hotel*, *http://www.hoteloscartangoecholima.com/splash.html*

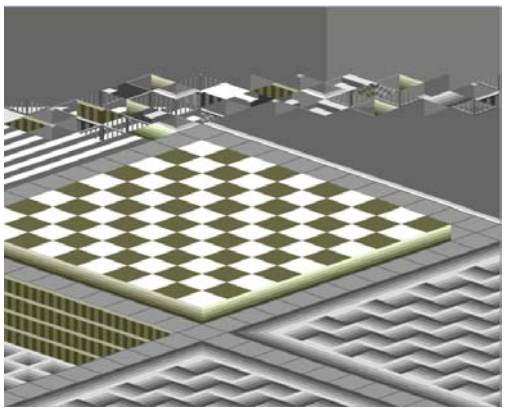

Figure 4.6.3.3 Wipe editing and mosaic transition in *Hotel*, *http://www.hoteloscartangoecholima.com/splash.html*

4.6.4. A Creative Interaction Example: *Roxik*

A motion design Website, *Roxik,* includes playful digital environments with no story line. Even though the playful applications in *Roxik* are not presented as comics, the stasis of the animations when there is no user interaction brings a comics quality to *Roxik*'s digital applications. In *Roxik*, the flying dots at the background and the very slight motion of the figures and objects create a simulation of a windy day. The users can tear apart the silhouette of human figures from the objects that they are hanging onto by dragging the silhouettes with the mouse. When torn apart and released, the silhouette of a human figure flies out the side of the frame. The object on which the figure was hanging flies right after the human figure. The object is then attached to another object with a rope. The leaving object drags and brings into the frame a new object with a new human figure attached to it (see Figure 4.6.4.1 and 4.6.4.2).

Figure 4.6.4.1 A digital toy from *Roxik*, http://www.roxik.com/

Figure 4.6.4.2 A digital toy from *Roxik, http://www.roxik.com/*

Even though Roxik does not have a story, it uses the procedural qualities of the digital medium in a more elaborated way and supplies a better participatory environment than in other current interactive comics (e.g., *Meanwhile, Days in a Day, Modern Living, Hotel, Poststress 2.0. Flow,* and *Fly Guy*). In *Roxik,* the user's playful interaction not only performs the function of navigating the frames but also establishes the atmosphere of the environment.

4.7. Comic Strip and Character Generators

Although Web comics' current use of digital media for creating interactive narrations is not well developed, they employ a more advanced way of using digital media in creating comic strip and character generators and in forming communities around a Web comic. Sites such as readwritethink.org or stripgenerator.com enable users to generate comic strips regardless of their drawing skills, selecting from a database of pre-designed panels, characters, settings, props, speech balloons, text boxes and manipulating the size, location, and direction of their selections (see Figure 4.7.1). Users can print out or post their creations to the *Stripgenerator* Website and they can comment on other people's creations. Sites such as befunky.com enable users to crop and cartoonize the head area in a photograph. The users then mount the cartoonized head to a cartoon body; dress it up; decorate their cartoon version with accessories; and locate it in a certain room or environment (see Figure 4.7.2).

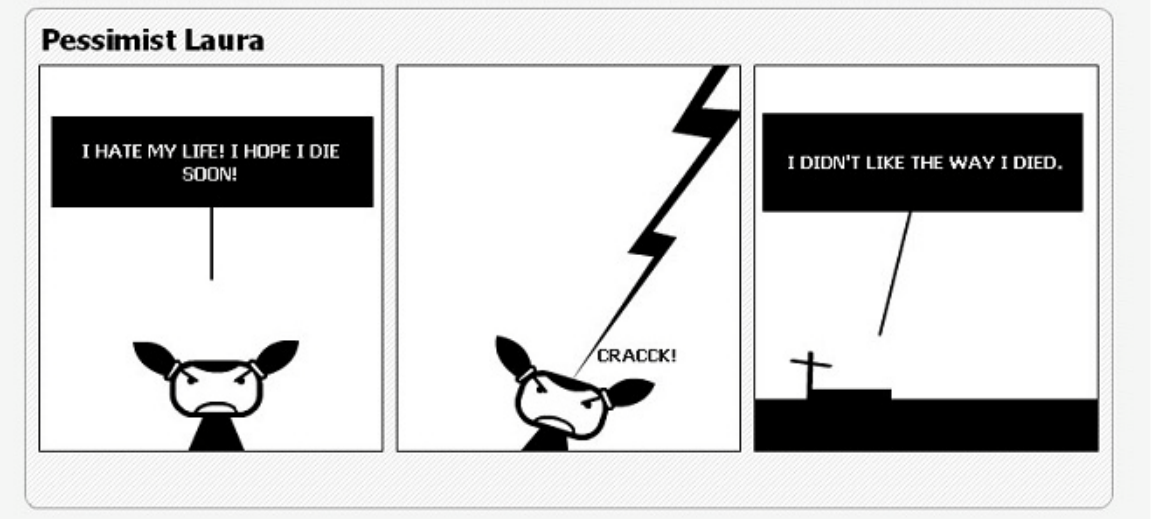

Figure 4.7.1 A comic strip that I designed at stripgenerator, http://stripgenerator.com/

Figure 4.7.2 An image of my dissertation committee members and me, generated at *Befunky* by using the head shots on the LCC Website, http://befunky.com/

4.8. Digital Communities

Most Web comics contain a forum section where readers can form communities around the Web comic and interact with each other. Most popular Web comics address a

certain group of people such as *Ph.D. Comics* for graduate students, *Dykes to Watch Out* for the GLBT community, and *Sluggy Freelance, Diesel Sweeties, Ctrl+Alt+Del,* and *MegaTokyo* for the gaming community. The insider jokes around a certain theme motivate the forming of a community. In printed media, there is a similar motivation for forming community around a particular comic. MacDonald (2005) mentions Stan Lee's attempts at community formation for printed comics and his use of the "Bullpen Bulletins page of Marvel Comics in the 1960s to promote a club-like inclusion." In digital communication, where users can view each others' responses, the response time is faster than in print comics. In addition to text, they can post images and animation on a forum board. All of these generate a more participatory environment than the print medium could offer. Moreover, a Web comics community becomes part of the creation process as comics artists reshape their works according to the feedback. For example, Sam Brown, the creator of *Exploidingdog* invites readers to email a title to him. Everyday he illustrates two or three of the selected titles (see Figure 4.8.1).

Figure 4.8.1 The readers contribute by suggesting a caption in *Exploding Dog*. The caption of this comic: Today is not the day, http://www.explodingdog.com/.

4.9. Conclusion

Web comics have generated a set of strategies that begin to exploit the digital medium's potential. Full-body interactive environments can benefit from some of these strategies in the following ways.

1. Web comics can include movement and still keep the essentials of comics rather than becoming animation-like. For example:

    a. In Web comics, a looping animation can play in a small region of a still frame. In full-body interactive environments, the performer can remain still and with a small gesture activate a looping animation.

    b. In Web comics the contents of the frame can remain still unless there is user interaction. In full-body interactive environments, the contents of the response panel can remain still if the performer does not move.

    c. In Web comics, the transition from one frame to another can be done via animation. In such cases, the use of animation creates invisible frames or smooth transitions. Embodied Comics environments can make similar invisible transitions via animation.

    d. In Web comics, the user interaction activates a looping animation in a small region of a still frame and this looping animation may create a gag. An Embodied Comics environment can supply a similar kind of effect with a full-body motion.

2. Scott McCloud's infinite canvas concept contains a vast potential to create new meaning-making strategies.

a. Existing Web comics use a large and finite space rather than an infinite canvas. The procedurality and spatiality of digital media allow comics artists to generate canvases that are literally infinite.

b. One way of generating an infinite canvas is to use procedurality within a single vertical frame.

c. An infinite canvas can be navigated with the use of coordinates.

d. Geotagging is an unexplored possibility for collaborative digital comics creations.

3. Full-body interactive installations may navigate large canvases by appropriating techniques used by Web comics to remediate filmic navigation. These techniques include:

a. Zoom-in and zoom-out

b. The imitation of a multiplane camera

c. 360 degree camera movement

d. Parallel editing

4. The digital medium offers a powerful meaning-making device to comics narration by making the frame borders dynamic, elastic, and participatory. A traditional PC set up offers a limited space for interaction. An Embodied Comics environment has a greater potential for making use of participatory frame borders since the performers interact with their full body.

5. The procedurality of the digital medium can generate comic strips and characters. For example, Embodied Comics environments can periodically take snapshots of the experience and generate a traditional comic strip version of the entire experience.

Current Web comics have begun to make use of the potential of digital media. That use has been limited, however, in at least two ways. First, developing digital environments that make more intricate use of digital media such as Google Street View, Web Canvas Project, Microsoft Pro Photo Tools 2, and Befunky requires a team of people. The difficulty of forming a team often delays the production of digital comics that might make better use of digital media. Second, in current Web comics, user interaction relies on a limited set of input and output devices (mouse, keyboard, and computer screen). These devices limit the range of possible interactions so that current Web comics cannot make full use of the participatory qualities of digital media. As a screen is a two-dimensional representational space, a regular PC environment allows only the user--and not real objects--to interact with the story. Moreover, none of the current Web comics attempts to utilize a webcam to make the user one of the characters of the story environment.

Just as the digital medium impacted film and comics, so it impacted performance art. In the next two chapters, I will explore the impact of analog and digital media on performance art.

CHAPTER 5

IMPACT OF ANALOG TECHNOLOGY ON PERFORMANCE ART

5.1. Introduction

The affordances of digital media have extended the meaning-making strategies of performance art traditions in a trajectory that has led to interactive performance comics. Just as the digital medium impacted film and comics, so it impacted performance art. However, prior to the impact of digital media on performance art, a set of non-digital factors prepared the way for the changes created by digital media. In Chapter 6, I investigate the impact of digital media on performance art. In this chapter, I examine the precursors. First, I will first look at the art movements that established certain characteristics of performance art. Second, I will introduce the new meaning-making channels created by analog-mechanical technology and analog-electronic technology for the performance medium. Third, I will investigate the qualities originating from the idea of participation.

In this chapter, the term “analog-mechanical technology” indicates any technology, such as postal services and the hand cranked film projector, that does not directly use electric energy. The phrase “analog-electronic technology” refers to technology that operates with electricity and is based on analog signals. Examples include the telegraph, cathode ray tube television set, and analog tape recorders. The analog-electronic technology takes the signal straight from the source and lays it onto a magnetic tape without converting the signal to the binary code “0” and “1.” I will refer to technology that is based on sampling of the analog signal in order to convert it to

numbers as “digital technology.” I have extensively discussed the definition of “digital performance” in the Introduction to the dissertation.

5.2. Impact of Art Movements

5.2.1. Futurism: Fragmentation, Replacement, and Participation

Dixon (2007) and Goldberg (2001) focus on the influence of art movements such as futurism and constructivism on digital performance. Futurism invites artists to design performance pieces by thinking of time and space as fragmented. Wooster (2005) outlines some of the factors that affect the perception and representation of space.

> The causal or parallel developments in mathematics (especially non-Euclidian geometry and fourth dimension), physics (Einstein’s theory of relativity), and philosophy, and the invention of new forms of transportation and communication altered the previous linear and static perception of and space to a simultaneous, fragmented, and conditional one. (p. 276)

The following examples illustrate the contextualization of fragmented time and space in the futurist performance pieces. Dixon (2003) uses examples from futurist photographs (chronophotography) (see Figure 5.2.1.1) where the subject is shot with a long exposure. The futurist paintings (see Figure 5.2.1.2) benefit from the implied movement and examples from performance art.

Figure 5.2.1.1 An example by Dixon (2003): *Polyphysiognomical Portrait of Umberto Bocciono* (1913) by Anton and Arturo Bragaglia

Figure 5.2.1.2 An example by Dixon (2003) *Dynamism of a Dog on a Leash* (1912) by Giacoma Balla

In Marinetti's *Simultaneity* (Simultaneia, 1915) two separate narratives take place on the stage simultaneously. In *The Communicating Vases* (1916), three different parts of the act take place in three unrelated locations. In addition to fragmentation of space and time, human actors were replaced with life-size marionettes in works such as Gilbert Clavel and Fortunato Depore's *Plastic Dances* (1918) and Casavola and Prampolini's *The Merchant of the Hearts* (1927). Moreover, the performance pieces produced by Futurists use the physical involvement of the audience. In Setimelli's *Gray + Red + Violet + Orange* (1921) an audience member is accused of murder. In Cangiullo's *Lights! (Luce!)* (1919) performers are "plants" and try to persuade the audiences to put on the lights by making noise. When the audience's noise reaches its peak the lights illuminate the stage and the curtain falls down.

5.2.2. Constructivism: Mechanical Devices for Actors

The dominant ideas of constructivism--mechanization, a belief in technology, the elevation of science, and the glorification of labor instead of artistic creativity--inform us about the possible aesthetic choices that could result from the merging of technology and performance. Manovich (2001) makes a list of the essentials of new media (numerical

representation, modularity, automation, variability, transcoding) and explains his taxonomy by analyzing Dziga Vertov's constructivist piece *Man with a Movie Camera* (1929). In *Man with a Movie Camera,* Vertov presents the camera as a giant mechanical and powerful character that can walk on its legs, look at the masses from the top; and manipulate the masses. In the digital performance pieces of the contemporary era, the replacement of human actors with mechanical-digital devices is a frequently employed meaning-making tool. The roots of substituting mechanical-digital devices for actors can be found in constructivism. Moreover, in *Man with a Movie Camera*, the use of visible montage reveals parallels between the legacy of constructivism and the aesthetics of digital art and performance.

5.3. Affordances of Analog Electronic Technology Extend Meaning-making Strategies of Performance Art Traditions

Analog electronic technology (slide projectors, microphones, analog video devices, TV screens, teletype machines, telecommunication devices, and photoelectrically triggered counters) influenced the development of performance art prior to the impact of digital media on performance art.

By using slide and film projectors and TV screens, analog video technology brought the concept of the celluloid / electronic double of the performer into performance art. The substitution of projected image(s) for the performer initiated the idea of absence of a live performer. Moreover, the use of projection technology in performance pieces contributed to the fragmentation of time and space through delay, non-simultaneity, and asynchronicity. The profilmic reality of the recorded image belongs to the past while it represents another timeline. Consequently, the inclusion of the projected images enabled

artists to think about time component in a more playful way. Especially in the cases where the animation medium is used, the time gap between the world of the live performer and the world represented by the projected animation might be millions of years.

5.3.1. Merging of Animation and Performance Art: Winsor McCay and Animated Gertie

5.3.1.1. Performance Act and Movie

Winsor McCay's performance act with animated Gertie and the movie based on this performance, *Gertie the Dinosaur* (1914), are very apt and rich examples of the fragmentation of time, the inclusion of the animation medium, and the projection technology of early performance art. According to the early film historian Crafton (1989), McCay's piece was originally a performance act. It later took the form of a live action/animated movie when McCay's performance with the projected animation of Gertie was adapted into a TV show.

The existing movie includes both live action and animated parts. The movie begins with a live action prolog in which McCay has a bet with his friends about his ability to make a dinosaur move. According to Crafton (1989), McCay's use of a dinosaur character is significant. In *Little Nemo* (1911), McCay's first animated movie, the animated character was a boy. The audience of that era had no knowledge of the animation medium, however, and when they watched *Little Nemo*, they thought that the animated boy was a puppet made of wires. Consequently, they did not appreciate the time and effort that had been invested in creating an animated boy with paper and ink. Since McCay wanted the public to appreciate the creative depth of his work, he animated a

mosquito character in his second movie, *How a Mosquito Operates* (1912), and following that, he animated a dinosaur for his performance act. Thus, the motive behind his performance act with animated Gertie was his desire to show his genius to the public.

According to Crafton, in his performance act, McCay appeared in an animal trainer costume standing in front of the screen where animated footage of Gertie was being projected. When McCay's live performance was adapted for TV, a live action prolog was included and intertitles were substituted for McCay's commands. Moreover, his physical presence was replaced with a cut out of him being carried by Gertie (see Figure 5.3.1.1.1).

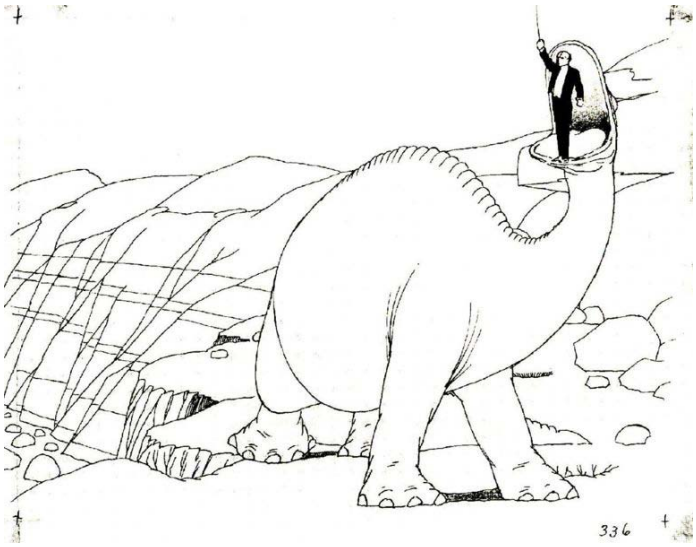

Figure 5.3.1.1.1 Gertie is taking McCay to her back, http://www.wired.com/geekdad/2008/09/10-cartoon-clas.

5.3.1.2. Lightning Sketch

In addition to the fact that *Gertie the Dinosaur* (1914) was originally a theatrical performance piece, the existing movie also included a second performance act, a lightening sketch, performed by McCay for his friends and incorporated into the movie at

the point where the live action prolog connects to the animated Gertie (see Figure 5.3.1.2.1).

Figure 5.3.1.2.1 Gertie comes alive as a product of lightening sketch performance, http://kadmusarts.com/blog/?m=200703.

According to Crafton, the first animation movies emerged from a vaudeville tradition—a saloon entertainment known as lightening sketches. In a lightening sketch performance, the performer (cartoonist) stands in front of the viewers and makes drawings on a drawing board with chalk or pen. The unexpected transformation of the sketch entertains the viewers. Crafton by using a record left by Edwin G. Lutz, provides the following illustration of a lightening sketch performance (see Figure 5.3.1.2.2).

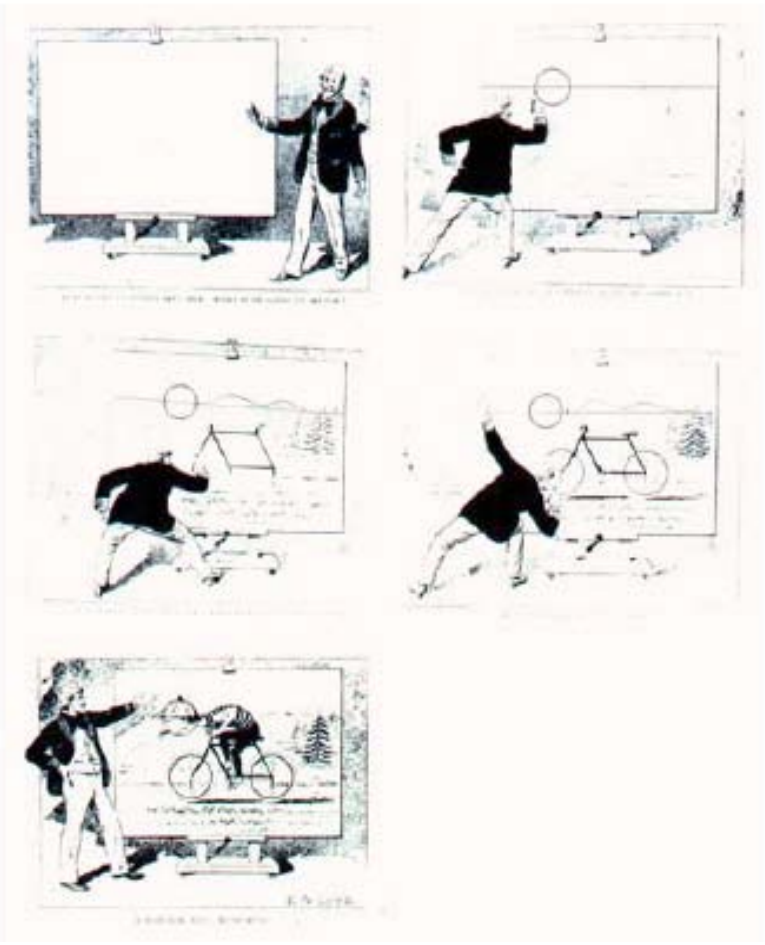

Figure 5.3.1.2.2 Lightening sketch performance in Crafton's (1982) *Before Mickey: The Animated Film 1898-1928*, (p. 49).

In this example, the drawing first appears to be a sketch of a landscape with a sunset behind a house. During the second half of the performance, with the addition of only a few lines, the drawing suddenly transforms into a cyclist moving from right to left across the page. It is this unexpected transformation that entertains the viewers in the room.

Lightening sketches such as Tex Antoine's weathercast were a popular TV act in 1950s. Tilden (2000) in his website describes Antoine's act as follows.

> He would start his weather segment standing next to an easel covered by blank papers, and he would proceed to draw the weather systems that were pertinent to

the nation and the area. As his hands drew in the lows, highs, and fronts, his voice would narrate their past and expected movements, and what their effects would be. As he filled page after page of the easel, building the map as he described each feature, he engaged his audience.

5.3.1.3. The Merger of Animation and Performance Art Begins with the Invention of Animation Cinema

The invention of the movie camera established a connection between this vaudeville tradition and animation by capturing lightening sketch performances on film. The manipulation and quick editing of the frames captured during the performance created the first animated movies and included the cartoonist/creator or the hands of the cartoonist/creators in them, creating the first recorded performance pieces. Surprisingly, none of the historians mention that the merger of animation and performance began with the invention of animation cinema. Animation indicates 'bringing to life' and performance art is live. Because of this common feature, animation and performance begins to merge at the invention of animation cinema. Film and performance historians include McCay's work in their analysis. However, they look at this example either through the lens of a film scholar or a performance arts scholar. None of them look at lightening sketches through a lens that is an amalgamation of animation, film, comics, and performance studies.

5.3.2. Delay

McCay's performance act with the projected image of an animated dinosaur introduces the concept of "delay" to performance art. In his performance, the animation medium was used to represent a dinosaur, an extinct animal. McCay's mastery of the

animation medium became even more apparent when the instructions he gave to a creature that lived 160 million years ago were obeyed.

5.3.3. Projected Images Substitute Décor, Costume, and Performers

In McCay's performance, the use of projected animation to create a second character signals the direction that the subsequent performance pieces would take as projected images replaced the actors, elements of décor, costume, and mis-en-scene.

In the following two pieces, the projected images substitute the décor and re-enforce the meaning created with the costumes. According to Kirby (1987), the performers in *The Ray Gun Spex* (1960) performances, were projecting the images of airplanes and parachutists on the walls. In *Requiem for W. C. Fields Who Died of Acute Alcoholism* (1960), Fields' movies are projected onto Hansen's white t-shirt. Dixon (2007) gives another example, *Shower* (1965) by Robert Whitman. In *Shower* Whitman "projected film footage of a life-size woman taking a shower onto the water-sprayed, billowing curtain of a working shower" (p. 90) (see Figure 5.3.3.1). The life size projection of the naked woman invites the voyeuristic gaze of the viewers and causes their momentary bewilderment because of the projected image's closeness to reality.

Figure 5.3.3.1 Robert Whitman's *Shower*,
http://amontanhamagica.blogspot.com/2004_08_01_archive.html

Shower is one of the examples in which the performer is replaced with the projected image. Her celluloid double performs for the viewers. Even though there is no live performer, the installation is a performance piece rather than a conventional film screening. The context of where the image is projected also reminds us of the performance-like moments of real life, such as a nude body framed with the borders of a shower stall.

5.3.4. Electro-Mechanical Devices for Performers

Just as the projected images substituted for live performers, so the electro-mechanical devices substituted for the actors. In Nam June Paik's *Participation TV* (1969), a human participant interacts with a TV set by speaking into a microphone attached to it. When the participant makes noises into the microphone, the TV set displays lines bursting in various directions in response (see Figure 5.3.4.1).

Figure 5.3.4.1. The TV set becomes a performer in *Participation TV* (1969), http://www.davidbermantfoundation.org/collection.php?sort=all

The use of robots and anthropomorphic devices more significantly indicates the possibility of a performance act without having performers. Norman T. White and Laura Kikauka designed male and female robots for their *Them Fuckin' Robots* (1988) comics-like act. The artists did not consult with each other except about the dimensions of the genitals of the female and male robots. The two robots encountered one another for the

first time in a public performance. Norman T. White describes the robots' interaction in his personal website.

> The male machine … responds to the magnetic fields generated by the female organ, thereby increasing its rate of breathing and moving its limbs, simultaneously charging a capacitor to strobing "orgasm." The female machine, on the other hand, is a diverse assemblage including a boiling kettle, a squirting oil pump, a twitching sewing machine treadle, and huge solenoid on a fur-covered board -- all hanging from an old bedspring and energized by an electronic power sequencer.

In *Them Fuckin' Robots* (1988), both artists are performers who are hidden behind the robots while the actual performance act in front of the public does not include live performers.

5.3.5. Responsive Set with the Use of Photoelectrically-Triggered Sensors

The use of photoelectrically-triggered sensors has contributed to the development of the responsive set. The props become the control devices of the story world. Laurie Anderson (1994) controlled the spot lighting with the flame of a candle light in her *For Instants* (1976/1977). Laurie Anderson lay down on the stage next to a burning candle and delivered her narration by talking towards the candle. The flame of the candle flickered in response to her breath and the flame intersected the path of a photocell beam when the flame moved away from her. The interruption of the beam activated a spot light illuminating her. While she was delivering her monologue, the strength of her breath determined the lighting effect--ranging from complete darkness to momentary light explosions. Similarly, Bill Kaminski designed tennis racquets in order to control the light

for Robert Rauschenberg's piece *Open Score (Bong)* (1966) (see Figure 5.3.5.1). Kaminski attached a miniature FM transmitter and a contact microphone with an antenna to each racquet. Each time the players hit the ball with their racquets a loud “bong” sound was heard. Each “bong” sound switched off one of the 48 lights and the game ended when the tennis field was in complete darkness.

Figure 5.3.5.1. The tennis racquets with a miniature FM transmitter and a contact microphone with an antenna for *Open Score (Bong)* (1966), http://www.medienkunstnetz.de/works/open-score/?desc=full

In Anderson’s and Kamiski’s pieces, light and dark seem to be a major trope. The technology incorporated in these two pieces is invisible. Sensors in Anderson’s piece and FM transmitters attached to the racquets in Kamiski’s piece are invisible to the viewers. The control of electric light in both of these pieces magically delights the audiences.

5.3.6. Performance Space Extends with the Use of Mailing System and Telegram

The development of the responsive set has not been limited to the theatrical stage as the performance space has expanded to include the surface of entire world through the use of the postal system and the telegraph. For example, Suzanne Lacy and Linda Pruess, in their participatory art event *International Dinner Party* (1979), used telegrams and the postal system for creating a platform in which more than two thousand women could participate. In their piece, women throughout the world hosted dinner parties and each small dinner community sent a telegram to the artists. The artists then displayed the telegrams in a series of albums. In another example, Maria Eichhorn, in her *Prohibited*

Imports (2003), did not use any specific technology other than the international postal system. According to Frieling et al. (2008) "[Eichhorn] mailed several parcels of books on AIDS, activism, gender, and art with explicit content from Berlin to her Tokyo gallery, assuming that Japanese officials would open and censor them" (p. 146). When only Mapplethorpe's work was censored, the artist exhibited the censored photograph next to a non-censored version of it and included books on legislation, law, freedom of press, and freedom of speech in Japan in her piece.

5.3.7. Telepresence and Telecommunication Technologies

In artists' quest to use the entire world as a stage, the postal system and telegraph gave way to telecommunication technologies, thereby bringing the idea of telepresence into performance art and accelerating the expansion of the performance space. In *Hello* (1969), Allan Kaprow developed the notion of a "telehappening" by connecting four distinct sites in Boston. People at the Massachusetts Institute of Technology, Boston Airport, a videotape library, and a hospital were able to see each other through cameras and monitors that were connected to the control room of the studio at WGBH radio. When engineers randomly switched the audio and video channels, people who already knew each other were able to see and hear each other. Frieling (2008) quotes from Kaprow's description of the happening:

> We called out, often in vain, Hello! Hello! Bob! I see you! I hear you but I don't see you know! Bob! Bob? The people gestured wildly as if this would bring their friends to them. … It was all very human and silly (p. 102).

In *Hole-in-Space* (1980), Kit Galloway and Sherrie Rabinowitz similarly expanded the idea of telepresence by making any member of the public a participant and connecting the

East and West Coasts of the United States. Passers-by in New York and Los Angles were able to see and hear each other through two big screens and two cameras installed in each location (see Figure 5.3.7.1).

Figure 5.3.7.1 Telepresence in *Hole-in-Space* (1980), http://www.ecafe.com/museum/hp_gy_1987/hp_gy_1987.html

According to Frieling (2008), Galloway and Rabinowitz refer to this event as a "public communication sculpture," describing the atmosphere they created with their installation as follows. "[T]he evening of discovery, followed by the evening of intentional word-of-mouth rendezvous, followed by a mass migration of families and trans-continental loved ones, some of which had not seen each other for over twenty years" (p. 140). In both examples of telepresence, *Hello* (1969) and *Hole-in-Space* (1980), participants are simultaneously bewildered and enthused as they transcend the limitations of geography, expand human perception through media, and experience a performance space that encompasses an entire city and even an entire country.

5.4. Impact of Participatory Art

In addition to the impact of art movements such as Futurism and Constructivism and of technologies (analog, mechanic, and electronic), digital performance art has been affected by the very construct of participation. In participatory art as in any type of

interpersonal communication, “trust” and “offense” determine the duration and playfulness of the communication act. Thus, some artists have invited the public to participate in the production of art while others have chosen to offend their participants. By purposefully offending participants, this latter group of artists took the risk of being physically and emotionally hurt by the participants they were offending. The following examples of participatory art range from works that reflect extreme trust among participants to works that illustrate an aggressive, offensive approach toward them.

5.4.1. A Vulnerable Performer

Yoko Ono in *Cut Piece* (1964), Abromović in *Rhythm o* (1974), and Valie Export in *Tapp-und Tastkino* (Tap and Touch Cinema) (1968) purposefully placed themselves in a vulnerable position by including the tools that participants might use to hurt them in their pieces (see Figures 5.4.1-5.4.3).

Figure 5.4.1 *Cut Piece* (1964), http://www.medienkunstnetz.de/works/cut-piece/

Figure 5.4.2 *Rhythm o* (1974), http://www.theslideprojector.com/art6/art6lecturepresentations/art6lecture13.html

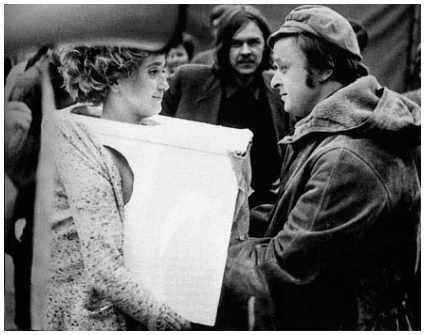

Figure 5.4.3 *Tap and Touch Cinema* (1968), http://www.x-traonline.org/past_articles.php?articleID=184

In *Cut Piece* (1964), Ono wears an expensive suit and sits on the stage with a pair of scissors in front of her. Audience members then come up to the stage and cut small pieces from her clothing until she is nearly nude. Ono's trust in the participants is visible not only as she provides a pair of scissors to any stranger's hand but also as she becomes nude and defenseless. During *Rhythm o* (1974), Abromović invited participants to do whatever they wanted to her body by using any of seventy two items, ranging from a rose to a razor, that she included in her piece. According to Frieling (2008), "the audience's aggressive actions escalated over the course of six hours during which Abromović's clothes were cut off, her body sliced with razors, and a loaded gun held to her head until another audience member wrested it away" (p.112). In her *Tap and Touch Cinema*

(1968), Valie Export attached a curtained box to her torso and offered her bare breasts to the participants. Her performance targeted the objectification of the female body in a playful way since the participants had to look at her face while touching her breasts in public. In each of these three acts the performers challenged the hierarchy between artist and viewer by taking the risk of being harmed and made meaning from energy released from the breaking of taboos.

5.4.2 Offending the Audience

In addition, while Ono, Abromović, and Export were placing themselves in a vulnerable position, they were also decisively pushing the participants into a socially awkward situation by playfully embarrassing them. Pushing the participants out of their comfort zones is a strategy of meaning-making. This strategy comments on taboos on personal space, gender, social class, and social norms. In *Imponderabilia* (1977) Abramovic and Ulay stood naked at the entrance of museum facing each other (see Figure 5.4.2.1).

Figure 5.4.2.1 *Imponderabilia* (1977), http://stephan.barron.free.fr/art_video/abramovic_ulay.htm

In order to enter the museum visitors had to pass through the small space between the two performers by facing either the naked male or the naked female performer. Video footage reveals the discomfort and repressed embarrassment that each visitor experienced. *Imponderabilia* comments on the taboos related to issues of personal space and gender by playfully offending participants. In *Proximity Piece* (1970), Acconci intimidated visitors at the Jewish Museum in New York City by stalking them through the museum. The photographic documentation of this process constituted the art work by including both the visitor looking at a piece and the stalker-artist behind him or her (see Figure 5.4.2.2).

Figure 5.4.2.2 *Proximity Piece* (1970) in Frieling's (2008) *The Art of Participation 1950 to Now*, (p.118)

Thus *Proximity Piece* blends the two functions of a museum space: viewing and production of art. The viewers were taking part in the production of an artwork while they were exploring the museum. Indirectly, Acconci's piece also questioned the established hierarchy between artist and viewer by making the viewers collaborators who are unaware of their contribution. The performers' offensive acts were similar to avant-garde film makers who purposefully agitated the viewers. However, unlike the avant-garde film makers, the performers are not reflections on a celluloid strip. Meaning-

making by purposefully offending the participants has a cost for performers. An agitated participant can always attack the performer.

5.4.3. Changing Function of a Museum Space

The inclusion of performance pieces in contemporary art museums has altered the conventional meaning of a museum space, shifting it from a place where visitors may view but not touch the art work to a place where visitors touching it. Participatory performance pieces have also altered the established hierarchy between artist and audience by giving participants and creator an equal significance in the piece as Frieling's (2008) quotes from Gillick, "My work is like the light in the fridge, it only works when there are people there to open the fridge door. Without people, it's not art—it's something else—stuff in a room" (p. 36).

5.5. Conclusion

In this chapter, I have explored the impact of art movements, analog, mechanical, and electronic technologies, and the idea of participation on traditions of performance art revealing a trajectory that leads to digital interactive performance comics. That trajectory may be summarized as follows:

1. Representations of time and space become fragmented. Digital performance pieces also contribute to this fragmentation. I will be exploring the impact of the digital medium on performance art in the next chapter. In the Embodied Comics environment (a subset of digital performance pieces), a live performer and her projected image on the screen can refer to different time and space zones. This difference creates the fragmentation of space and time.

2. Actors, décor, and costume are replaced with projected images and mechanical or electronic devices as I will explore in the next chapter, the digital double substitutes for the actor in digital performance. In Embodied Comics environment, self-projection creates the digital double.

3. Props, lights, and décor gain participatory status, leading to the establishment of responsive set. In digital performance pieces, the performance set becomes more responsive while in full-body interactive environments, any object can be tracked, thus becoming a part of the responsive set.

4. The theatrical stage extends to the entire public space.

5. By purposefully offending viewers, performers become vulnerable. Offense and vulnerability, then, turn into meaning-making tools. An artist can design a piece for an Embodied Comics environment in which she can produce humor by purposefully and playfully offending both viewers and participants. The main motive of producing humor with a purposeful offense is based on superiority theory. Bennett and Royle (2004) quote from Thomas Hobbes who defined superiority theory: “The passion of laughter is nothing else than sudden glory arising from some eminency in ourselves, by comparison with the infirmity of others, or with our own formerly” (p. 95).

6. With participation, museum space transforms from a place for the display of art to an environment for the creation of art. When located in a museum setting, an Embodied Comics experience can enable participants to become a part of the creation as well.

Affordances of digital media continue to shape the meaning-making strategies of performance art traditions. In the next chapter, I will explore how digital media contributes to the development of six meaning-making methods.

CHAPTER 6

IMPACT OF DIGITAL TECHNOLOGY ON PERFORMANCE ART

6.1. Introduction

The mechanical and analog-electronic technologies of the pre-digital era began to make a change in the medium of performance by extending tools and conventions for meaning-making. However, the procedural, participatory, encyclopedic, and spatial qualities of digital media have drastically accelerated the impact of technology on the performance medium and have continued to define its characteristic artistry.

Various forms of participatory art events (games, interactive narrations, DJ and VJ performances, digital installations, networked performances, the unconventional uses of surveillance technologies, robotics, and biomedical technologies) fit in the expanding set of digital performance. The blending of emerging digital technology into performance art takes the meaning-making channels shaped by art movements and pre-digital technology forward.

6.2. Fragmentation of Time and Space

In digital media, the representation of time becomes even more fragmented as it became non-linearly controllable in a manner similar to human memory. The procedural quality of digital media enabled artists to select moments from the entire event in a non-linear fashion and reorganize those moments. The source materials of David Rokeby's *Gathering* (2004) and Camille Utterback's *Abundance* (2007) are the passersby walking around the buildings where Rokeby's and Utterback's installations are located. Even though these two pieces are video and computer-vision-based installations, they are also

digital performance pieces since there are performers and viewers. In *Gathering* (2004), Rokeby's system captures and reorganizes images of the public moving outside the building according to three paradigms: color, height, and spatial location. It projects the reorganized image to eight screens sequenced in the form a circle with a slight tilt so that the viewers can walk into the center of the circle (see Figure 6.2.1).

Figure 6.2.1 *Gathering* (2004), http://homepage.mac.com/davidrokeby/gathering.html

Since his variables are independent of time, his system fragments time into the small bits of a non-linear mode. One of the works of Bureau of Inverse Technology, Natalie Jeremijenko's *Suicide Box* (1996) uses video surveillance to critique the data collected by a US government's surveillance systems. *Suicide Box* is a computer vision system located at the Golden Gate Bridge, San Francisco which appears as the premiere suicide location in the United States. *Suicide Box* detects the vertical movement and immediately begins recording the scene. When the footage is played it shows that people are jumping off the bridge one after another. According to Jeremijenko's website *Suicide Box* recorded 17 suicides while the Port Authority reported only 13. In wired.com she reports that "[t]he idea was to track a tragic social phenomenon which was not being counted -- i.e., doesn't count." *Suicide Box* (1996) challenges the official data released by the government by

making an invisible part of a public space visible and by measuring the events with the aid of technology. The system collects moments according to one paradigm, vertical movement, during a year and creates a fragmented representation of time by emphasizing repetition. However, Jeremijenko's system functions passively; it voyeuristically recording rather than offering a solution to the suicides.

6.3. Simultaneity

The concept of simultaneity has gained significance in relation to the interaction of living people and nonliving objects. Utterback's *Abundance* (2007) operates at night, capturing images of people walking around the City Hall Plaza in San Jose, California. It simultaneously generates a dynamic animation responding to the movement of each person and projects the animation on the façade of a 3-story cylindrical rotunda (see Figure 6.3.1).

Figure 6.3.1 *Abundance* (2007), http://www.camilleutterback.com/abundance.html

6.4. Delay

In digital interactive environments, the concept of delay becomes the key narration tool for building up expectation and surprise. In Rokeby's *Installations: Machine for Taking Time (Boul. Saint-Laurent)* (2007), there are no live performers.

Architecture, nature, light, and time are the performers of this installation. Two high-definition cameras attached to the Foundation Daniel Langlois building in Montreal captured 1024 images per day from March, 2006 to March, 2007, creating footage by seamlessly editing the photographs in a random time sequence (see Figure 6.4.1).

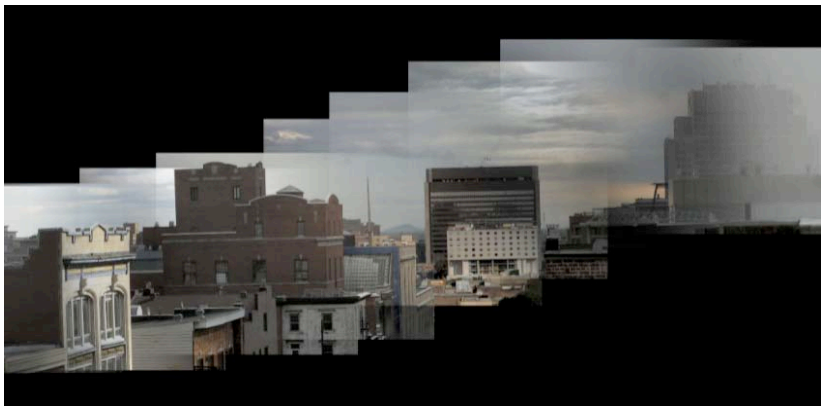

Figure 6.4.1 The route of the camera in a video footage is represented in sequenced photographs in *Installations: Machine for Taking Time (Boul. Saint-Laurent)* (2007), http://homepage.mac.com/davidrokeby/mftt_fdl.html

In the course of a day, the images may reveal a micro-narrative, such as a stroller moving in the park. In the course of a year, the fog, rain, snow, and the change of light through the seasons become visible at the video output. In this way, the paradigm of delay constitutes the surprising effect of the installation: the seamless, non-linear juxtaposition of images that belong to different moments of a year.

6.5. Expansion of the Stage and Coexistence

Emerging virtual performance environments begin to erase the limitations of geography by turning the entire social space into a theater stage. In *Second Life* (2003), Eva and Franco Mattes' reenactment of Abramovic's *Imponderabilia* enables anyone regardless of geographic location to participate and walk in between the naked performers (see Figure 6.5.1).

Figure 6.5.1 Eva and Franco Mattes' reenactment of Abramovic's *Imponderabilia* in *Second Life* (2003), http://www.0100101110101101.org/home/performances/performance-abramovic.html

In digital environment, the concept of telepresence enhances the idea of being present in two geographic locations with the help of video projections, allowing participants to coexist in both spaces as a consequence of their actions. For example, Stelarc's *Ping Body* (1995) installation enabled participants who were in three different locations (Paris, Helsinki, Amsterdam) to view and actuate Stelarc's body at the main performance site in Luxemburg via a computer-interfaced muscle-stimulation system (see Figure 6.5.2).

Figure 6.5.2. *Ping Body* (1995), http://framework.v2.nl/archive/archive/leaf/other/.xslt/nodenr-15387

Moreover, Stelarc on his website mentions that according to Web server statistics, *Ping Body* was viewed world wide. In another version of his *Ping Body* performance, he

mapped the muscle stimulation onto internet traffic data. In that case the issue of being present in two different geographic locations was represented in a more elaborated way since almost anyone who was online took a part in moving Stelarc's body.

6.6. Vast Number of Participants

As the entire world surface becomes a performance space, the design of performance pieces for a vast number of participants becomes easier. Moreover, in world-wide participatory events, the digital collection and processing of data results in an immediate pay-off. The digital communication systems enable artists and participants to spread the word quickly and develop organized plots in a short time period as compared to communicating with mail and telegram as artists communicated while organizing *International Dinner Party*. For example, the New York-based improvisation group Improv Everywhere in their *Frozen Grand Central Show* included 207 Improv Everywhere Agents. The Agents simultaneously froze in place for five minutes in the Main Concourse of Grand Central Station while passersby were trying to understand the mystery (see Figure 6.6.1).

Figure 6.6.1 *Frozen Grand Central Show, http://improveverywhere.com/2008/01/31/frozen-grand-central/*

The gathering of agents and the organization of the event had been orchestrated through the improveverywhere.com website and the mailing lists. *G-7 Stock Puppets* (2000) by Jim Mason et al. is another example of the use of vast numbers of participants in a digital environment (see Figure 6.6.2).

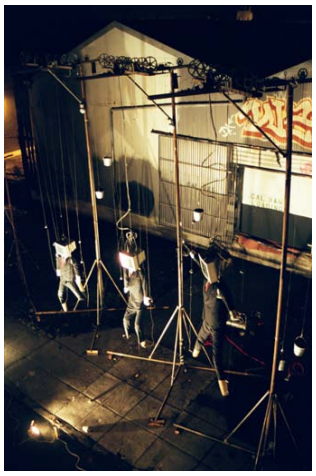

Figure 6.6.2 *G-7 Stock Puppets* (2000), http://www.stockpuppets.com/photos.html

In this installation, seven larger-than-life marionette puppets move in accordance with the movement of global stock markets. Anyone buying or selling stock becomes a participant of this performance piece.

6.7. Digital Double and Transformation

The celluloid-electronic double (film and video projection) has grown into the digital double (digital image). Since digital images are independent of profilmic reality the digital double has greater plasticity in its transformations and responsiveness than does the celluloid-electronic double. In Daniel Rozin's *Mirror Number 2* (2000) (see Figure 6.7.1) and Daniel Shiffman's *Swarm* (2002) (see Figure 6.7.2), the projection of the participant constantly transforms in reaction to the interactor's movement. Daniel

Rozin's *Wooden Mirror* (1999) (see Figure 6.7.3) uses the transformative quality of the digital image in a more elaborate way.

Figure 6.7.1 *Mirror Number 2* (2000), http://www.smoothware.com/danny/newmirror2.html

Figure 6.7.2 *Swarm* (2002), http://www.shiffman.net/projects/swarm/

Figure 6.7.3 *Wooden Mirror* (1999), http://bridell.com/tag/installation/

Rozin's system takes digital input via a webcam, processes the information digitally, and then executes an analog output via its kinetic screen made of wooden pixels. The composed reflection of the participant is a mirror image similar to a regular video projection. In the first look, the composed image does not have any transformative qualities. However, the screen on which the participant's reflection is composed is transformed by the rotation of the wooden pixels.

These three installations, *Mirror Number 2* (2000), *Swarm* (2002), and *Wooden Mirror* (1999) exemplify the plasticity of digital images rupturing the similarity between the performers and their celluloid-electronic doubles as those doubles evolves into abstract images. Similarly in Camille Utterback's *Untitled 5* (2004) (see Figure 6.7.4), the performer's movements generate a real-time abstract painting on the screen.

Figure 6.7.4 *Untitled 5* (2004), http://www.camilleutterback.com/untitled5.html

6.8. Digital Technology as a Barrier for Purposefully Offensive Acts

In digital interactive environments, the presence of a user interface, avatars, and the hardware of the computer constitute a barrier between performance artists and the public. Artists who have chosen to offend the viewer in their participatory performance acts can hide behind the barriers of digital interactive environments and avoid taking risks. For example, Franco and Eva Mattes distributed a computer virus called

"biennale.py" as a work of art at the 49th International Art Biennale of Venice in 2001. According to Franco and Eva Mattes' website, today the virus biennale.py is still active and cannot be deleted by major internet security providers such as Norton (see Figure 6.8.5).

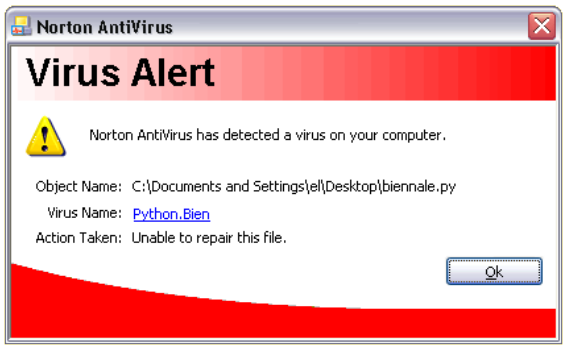

Figure 6.8.1 Norton's inability to eliminate the threat of "biennale.py", http://www.0100101110101101.org/home/biennale_py/virusdetection.html

The virus they distributed sucks energy from the computer while it remains invisible. Because the computers and technology involved in the dissemination of the offense constitute a barrier between the artists and the public, a frustrated user of an infected computer cannot take any action that could physically harm the artists. A frustrated user cannot even sue Franco and Eva Mattes since the virus project was sponsored by the 49th Venice Biennale and Microsoft. In an interview with Cornelia Sollfrank, Eva Mattes has claimed that producing a computer virus is not a crime, while disseminating it is. Consequently, one might sue 49th Venice Biennale, Microsoft, people wearing t-shirts with the code of the virus, and magazines such as Domus, Mute, and Wired that published the code but not Eva and Franco Mattes. Eva Mattes also states that "as part of an organization that produces art, my only responsibility is to be irresponsible." In this example, not only digital media but also the digital media corporations, digital media

magazines, and art organizations function as a barrier between the viewer and the performer who is purposefully offending the viewer.

Because of such barriers, digital interactive media artists can make meaning by intimidating participants while taking no risks themselves. Marie Sester's *Access* (2003) provides an apt example. In Sester's installation, a tracking system identifies a candidate among visitors of the Siggraph 2003 exhibition. The system (2003) then directs a spot light on the chosen person (see Figure 6.8.6).

Figure 6.8.2 *Access* (2003), http://www.accessproject.net/

Everybody's attention is directed toward the selected visitor, who regardless of his or her intention to perform, is cast as a performer. If the performer runs away from the circle of the spot light in order to avoid being the center of attention, the spot light follows him or her. The digital and mechanical system of *Access* (2003) is the barrier between Marie Sester and visitors who may feel intimidated or even angry about being at the center of public attention.

6.9. Creating Unaware Performers and Participants

Because the emerging digital media has so greatly expanded possibilities for surveillance, digital media specialists are more able than ever to create environments in

which participants are unaware of their participation. Tracking individuals becomes easy because of the miniaturization and low cost of a digital camera, the real-time responsiveness of digital media, mobile technologies, the credit card system, Google maps, photography upload sites, and the Google search. As a result of this increased surveillance potential, the border between private and public spaces disappears and random people become major actors in an event while they consider themselves alone in their private worlds. In the visual database of *Google Earth,* for example, some users look for naked or scantily clad people, capture them and share those images in online communities (see Figure 6.9.1-6.9.3).

Figure 6.9.1 Naked people captured on *Google Earth, http://googlesightseeing.com/2006/11/28/top-10-naked-people-on-google-earth/*

Figure 6.9.2 Naked people captured on *Google Earth, http://googlesightseeing.com/2006/11/28/top-10-naked-people-on-google-earth/*

Figure 6.9.3 Naked people captured on *Google Earth, http://googlesightseeing.com/2006/11/28/top-10-naked-people-on-google-earth/*

The Use of *Panasonic's Network Cameras* is another case in point. This device offers consumers a way to monitor activity inside their homes or work spaces by accessing real time visuals via the World Wide Web. In order to access the real time surveillance images, users have to enter their passwords. However, if a user does not create a password while setting the surveillance system, anyone who makes a Google search with the keyword, "inurl:CgiStart?page=Single" (a line in the code), can access that user's personal navigation page, and from there, can access their work or home space (see Figure 6.9.4 and 6.9.5). Moreover, anyone who accesses the user's personal page can physically move or control the surveillance camera in real time by using the navigation interface on the page. In this example, private space becomes public space unbeknownst to owner of the space. The attempt to make these spaces secure locations ends up making them more vulnerable ones. A programmer, by disseminating a line in the code, creates performers who are unaware of their performance.

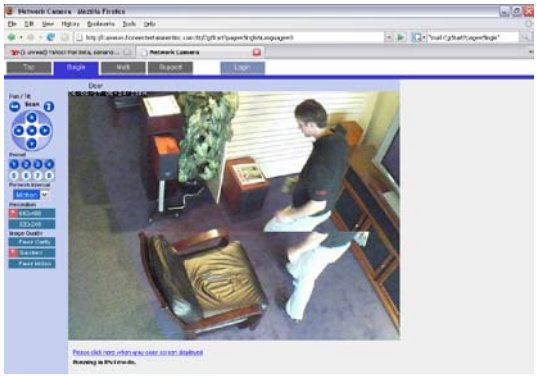

Figure 6.9.4 A failure of a surveillance based security system makes the owners of the system visible, http://camera1.homeentertainmentinc.com/CgiStart?page=Single&Language=0.

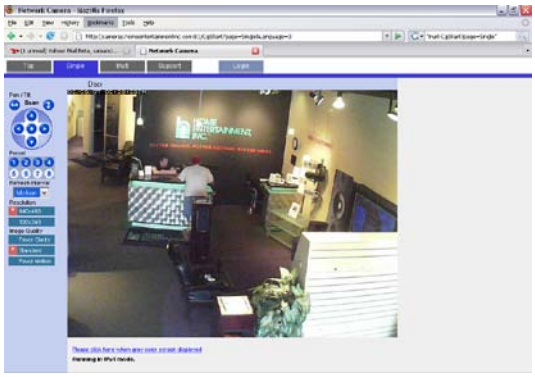

Figure 6.9.5 A failure of a surveillance based security system makes the owners of the system visible http://camera1.homeentertainmentinc.com/CgiStart?page=Single&Language=0.

While neither the Google maps nor the Panasonic Network Camera example is intentionally designed as an art event, they each blur the distinction between public and private space and create unaware performers.

6.10. Increasing Potential of a Responsive Set

The advent of physical computing increased the capabilities of a responsive set. According to Broadhurst (2007), since the performers have a crucial role in creating the media that "media is actually literally part of a live performance.… Instead of being

separate from the body, technology becomes part of that body, at the same time altering and recreating the body's experience in the world" (p. 111). The performance set, then, has evolved into a living organism and gained importance equal to that of a live performer. For example, the kids who get involved in the story world of Bobick's *KidsRoom* (1996) interact with the talking furniture in the room (see Figure 6.10.1).

Figure 6.10.1 *KidsRoom* (1996),
http://vismod.media.mit.edu/vismod/demos/kidsroom/kidsroom.html

When the bed on which kids sit, turns into a boat they have to paddle. In another example of the responsive set in this piece, the monsters projected on the walls through computer vision technologies interact with the kids imitating their behaviors and trying to teach them how to dance. Kelly Dobson's *Blendie* (2003) provides another example of a responsive set. In this installation, a participant interacts with the 1950's Osterizer blender that does sound analysis (see Figure 6.10.2).

Figure 6.10.2 *Blendie* (2003),
http://www.coolhunting.com/archives/2006/03/kelly_dobsons_b.php

6.11. Merging of Virtual and Real in the Responsive Sets

The capabilities of a responsive set become more sophisticated as a consequence of the merging of the virtual and the real. For example, installations and performance environments such as Utterback and Achituv's *Text Rain* (1999) and Mateas and Stern's *Façade* (2005) combine virtual and real worlds. *Text Rain* (1999) offers participants an opportunity to combine the virtual and real as they use real objects (such as a large piece of fabric) to interact with a set of virtual letters projected on a screen. (see Figure 6.11.1).

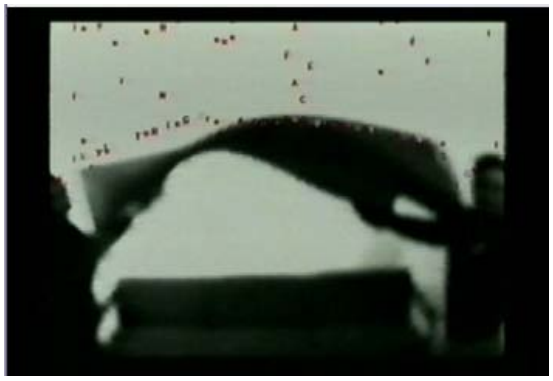

Figure 6.11.1 Use of fabric in *Text Rain* (1999), http://www.camilleutterback.com/movies/textrain_mov.html

Similarly, in *Façade* (2002), a live participant interacts with two virtual characters, Grace and Trip, whom the participant sees through virtual reality goggles. The participant guides the unfolding of the plot by touching real objects in the physical world. In this installation, the performance set, Grace and Trip's house is a responsive environment, almost like a living organism, that can be considered one of the characters of the story world.

In a completely virtual performance environment such as any of the Second Front's performance acts in *Second Life* (2003), the limitations of the physical world (e.g., time, expense, and adherence to the laws of physics) do not apply. Consequently,

both performance set (costume, décor, props, and light) and performers may be designed and manipulated as flexibly as in the animation medium. Moreover, the real world problem of wearing out an installation does not apply in virtual performance. Thus, a situation, such as that described by Frieling (2008), in which Robert Morris's physical installations were destroyed by overuse during his 1971 retrospective at London's Tate Gallery, would never occur in a an installation designed for a virtual environment.

6.12. Conclusion

In the previous chapter, I explored the impact of art movements, technologies (analog-mechanical and analog-electronic), and participation on the performance art tradition, a developmental trajectory leading to digital interactive performance comics. In this chapter, I traced the role of digital media in reshaping performance art traditions and in creating new strategies of meaning-making. These strategies include:

1. In digital performance pieces, space and time components have become fragmented and indexed in non-linear ways. Thus, in the Embodied Comics environment since the live performer and the images on the projection screen are separate, this allowing the story to develop in parallel but separate spaces, and in parallel but separate times (past, present, and future).

2. The responsive set of digital performance spaces generates simultaneous response, in itself a powerful meaning-making tool. In Embodied Comics environments, the system projects the comics version of the performer on the projection screen in real time, as the performer acts. This simultaneous transformation constitutes the essence of Embodied Comics.

3. In digital performance pieces, the concept of delay in relation to the non-linear processing of time has become a major meaning-making tool. In an Embodied Comics environment, a traditional comic strip version of the entire experience can be generated, by periodically capturing snapshots of the happening. These snapshots represent delay as they belong to an earlier time in the development of the story.

4. In digital performance pieces, the performance set has been expanded to include the entire social space. Telepresence and the use of World Wide Web have allowed simultaneous participation by vast number of participants across the entire globe. Full-body interaction installations can use a larger performance space as well, expanding a traditional set designed for a happening.

5. In digital performance pieces, the digital double with its transformative quality and simultaneous responsiveness allows much more plasticity than the celluloid-electronic double. In an Embodied Comics environment, the live performers see their projections on the screen, creating a plasticity similar to that of the digital double.

6. In the cases where artists purposefully offended participants, the digital systems constitute a barrier between the agitated participant and the artists.

7. Especially with surveillance technologies, digital media artists are able to create participants who are unaware of their contributions.

8. The advent of physical computing has increased the capabilities of a responsive set. Similarly an Embodied Comics environment can track any kind of physical object, making all props a part of the responsive set.

9. As the virtual and real are merged in digital performance pieces the capabilities of a responsive set have become more sophisticated with more flexible options. In an

Embodied Comics environment, the performer can see his or her distorted silhouette, which looks like a comic character on the projection screen, and viewers can see both the live action performer and the performer's reflection at the same time.

10. The problem of wearing out an installation is diminished in digital performance pieces.

Now, we have list of meaning-making strategies created by the influence of digital media on comics, film, and performance art. In the following chapters, I will synthesize these strategies and point out the essential meaning-making devices of full-body interactive installations.

CHAPTER 7

FULL-BODY INTERACTION INSTALLATIONS: PHYSICALITY AND DISTANCE

7.1. Introduction

Just as the implied distance between the viewer and the scene is a meaning-making tool in painting, comics, photography, film, and animation, so it is a meaning-making device in full-body interactive installations. In this chapter, I will briefly illustrate the use of distance as a meaning making device in legacy older media, then I will discuss the complex characteristics of physical distance in a full-body interactive environment and investigate the meaning-making strategies that can be developed from the procedural manipulation of physical distance.

In addition to implied and physical distance there is a conceptual distance between the viewer and the representation. In this chapter, I will also explore the methods of controlling this conceptual distance.

7.2. Perceived and Physical Distance as a Meaning-making Tool in Painting, Comics, Photography, Film, and Animation

In painting, comics, photography, film, and animation, there is a physical distance between the canvas/screen and the viewer. In each of these media, the size of the artwork, especially it is small, invites the viewer to come closer and bring the artwork into the viewer's personal space. Charlie Kaufman in his movie *Synecdoche, New York* (2008) portrays a painter, Adele who makes microscopic portraits of the people that she knows (see Figure 7.2.1). In her exhibitions, the visitors wear magnifying glasses and come very

close to her paintings to explore her work (see Figure 7.2.2). Visitors establish an intimate relationship with the characters in the paintings by taking Adele's tiny portraits into their personal spaces.

Figure 7.2.2. Adele's husband Caden is viewing Adele's paintings in an exhibition room with magnifying glasses. Screenshots are captured from the official trailer of the movie, http://www.youtube.com/watch?v=XIizh6nYnTU.

Figure 7.2.1. Adele in *Synecdoche New York* (2008) makes microscopic paintings. Screenshots are captured from the official trailer of the movie, http://www.youtube.com/watch?v=XIizh6nYnTU.

In addition to a viewer's physical distance to the canvas there is also a viewer's perceived distance from the scene, created by the distance between the camera or the virtual camera and the actors and props. The following examples illustrate the use of perceived distance in comics, painting, photography, film, and animation.

In the panel from Anders Nilsen's comic story, *The Gift*, a gun is fired from a distant location (see Figure 7.2.3). The viewer's implied distance from the gun and from

the target is designed to increase the viewer's curiosity since he or she cannot see the motives, details, and consequences of the shooting.

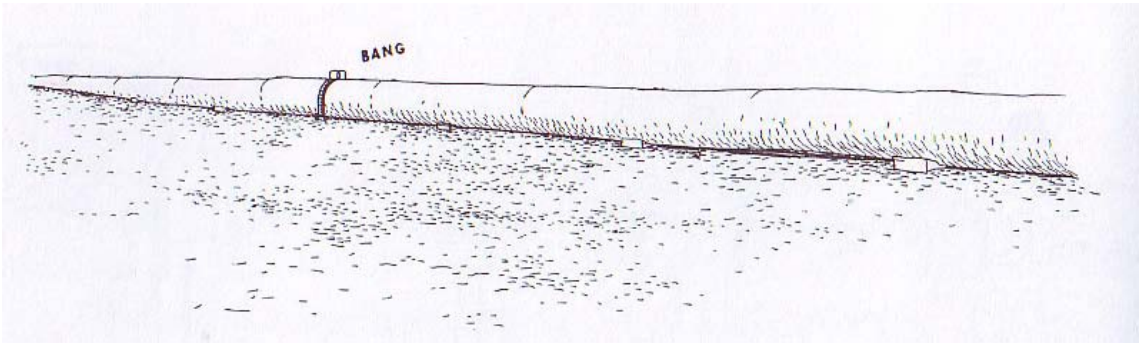

Figure 7.2.3 The use of distance in the medium of comics: Anders Nilsen's (2007) comic story, *The Gift* in *Dogs and Water*, (p. 88)

Figure 7.2.4 The Royal couple in the mirror in Velazquez's seminal piece, Las Meninas: The use of distance in the medium of painting, http://en.wikipedia.org/wiki/Las_Meninas

Velazquez's seminal oil painting *Las Meninas* (1656) creates a playful confusion of distance by placing the royal couple in a mirror hung on a distant wall (see Figure

7.2.4). Velázquez portrays himself in the painting as a figure painting a large canvas, gazing outward, looking either at us or at his live models (the royal couple). The existence and location of the royal couple is playfully confusing. If the image in the mirror is a reflection of the painting on which Velázquez is working, the royal couple may not be in the room. In this case, Velázquez gazes at viewers (us). If the royal couple is in the room and Velázquez is looking at them, where are the viewers located? The ambiguous presence of the royal couple and the unknown quality of the distance between viewers and the royal couple is playfully disorienting. This uncertainty creates playfulness and invites viewers to explore the painting further.

In photography, Henri Cartier Bresson's *The Seats Opposite* (1975) portrays a couple sleeping in a train compartment (see Figure 7.2.5). By capturing the scene from the seat opposite the couple, Bresson places viewers in the compartment with the couple. This proximity to an intimate scene creates a sense of voyeurism, allowing viewers to witness a very private moment and thus creating a sense of intimacy mixed with guilty pleasure.

Figure 7.2.5 Use of distance in photography: Henri Cartier Bresson's *The Seats Opposite*, http://www.designautopsy.com/blowup/

The opening scene of Hitchcock's *Marnie* (1964) also makes meaning with the distance element. *Marnie* begins with a close up of a yellow purse carried by a woman in a train station (see Figure 7.2.6). The woman walks away from the camera with the purse under her arm. The purse is the focus. The camera does not track the object of our interest and the purse appears to get smaller and smaller (see Figure 7.2.7). Hitchcock uses this scene to build up expectation and curiosity.

Figure 7.2.6 Use of distance in *Marnie* (1964), screenshot is captured from the movie.

Figure 7.2.7 Use of distance in *Marnie* (1964), the screenshot is captured from the movie.

The use of a virtual camera in computer animation can create extreme close-ups as well, much more easily, in fact, than a real camera can. For example, in Bunny Schendler's animated movie, *The World of Interiors* (1991), the spectator's point of view follows the main protagonist as he becomes lost and merged with his physical environment. In one scene, he shrinks and walks through the loops of his carpet through

virtual camera movements (see Figure 7.2.8). His absorption into the house, his being inside the carpet, helps the viewer to identify with the character's attachment to his home. Even though the animated character tries, he cannot leave his home. Each time he intends to step out, he realizes that he has forgotten a routine task he has to perform (watering the plants, phone call, etc) or that he has forgotten, an umbrella perhaps, so he goes back home. With extreme close-up shots, the camera locates the viewer inside the carpet while the protagonist makes his way through the carpet. The viewer's closeness to the scene reinforces identification with the character and exemplifies the use of distance for meaning-making in the medium of animation.

Figure 7.2.8 Use of distance in animation: Bunny Schendler's *The World of Interiors* (1991), the screenshot is captured from the movie

7.3. Physical Distance as a Meaning-making Tool in Digital Installations

As we have seen distance can be used for meaning-making in comics, painting, photography, film, and animation. In full-body interactive installations, the distances among the camera, the performer, the viewers, and the representational panel are related to each other in even more complex ways including

1. The distance between the performer and the camera;

2. The distance between the performer and the representational panel (i.e. projection screen);

3. The distance between the viewers and the representational panel; and

4. The distance between the viewers and the performer.

7.3.1. The Distance between the Performer and the Camera

The essence of comics, painting, and photography is their stillness. All motion is implied, using, for example, motion lines behind a running character in comics, brush strokes in oil painting, and long exposure in photography. In these media, even if there is an implied motion, the distance between the camera and the object is stable. Film on the other hand, is a time-based medium and the camera can move. In film, a director can create meaning through motion by moving the camera and manipulating the distance between camera and filmed object.

A full-body interactive installation is also a time-based environment, like film, so it can include camera movements. However, most full-body interactive installations such as, *Shadow Monsters* (2005), *Messa Di Voce* (2003), *Electronic Mirror* (1993), *Suicide Box* (1996), *Wooden Mirror* (1999), *KidsRoom* (1996), *Text Rain* (1999), *Untitled 5* (2005) and all of Scott Snibbe's computer vision based works, include a fixed camera mounted at a specific location. Just as making a movie by positioning the camera in a single location could limit the narration potential of the film medium, so, relying on a fixed camera in full-body environments limits the meaning-making potential of that medium. While using a stable camera simplifies the complexity of physical distances among the performer, viewers, response panel, and camera, the meaning-making potential of the medium is diminished.

In computer-vision-based works, the use of camera movements expands the possibilities for meaning making. A head-mounted display, for example, eliminates the physical distance between viewer and the representational panel. Just as a performer can wear a head-mounted display, so a camera can be attached to the body of the performer. Either choice will make the camera mobile; eliminate the distance between the performer and camera; and challenge the prevailing meaning-making methods in full-body interactive installations.

The installations, *Shadow Monsters* (2005), *Messa Di Voce* (2003), *Electronic Mirror* (1993), *Wooden Mirror* (1999), and *KidsRoom* (1996) utilize a conventional distance of a few feet between the performer and the camera. *Suicide Box* (1999) differs from all of these installations with its significant use of long distance between an unaware performer committing suicide at the Golden Gate Bridge and a camera located at a point far from the bridge.

7.3.2. Distance between the Performer and the Representational Panel

In most full-body interactive installations, the performer looks at a display screen, or representational panel, located a few feet a way. An installation using a head-mounted display eliminates the physical distance between the performer and the representational panel, although the images on the head-mounted display imply a perceived distance to the performer. For example, in the artificial reality version of the interactive drama *Façade* (2002), the performer wears a head-mounted display. The physical distance between the head-mounted display and the performer is almost zero, but the performers can perceive an implicit distance between the virtual characters and themselves. Digital artworks with

a display screen on which the performers can walk create another playful challenge in the arena of distance.

Figure 7.3.2.1 *Boundary Functions* (1998), http://snibbe.com/scott/bf/

For example, in Snibbe's *Boundary Functions* (1998) the performers can walk on the representational panel (see Figure 7.3.2.1). While the distance between their feet and the representational panel is zero, the performers see the plane from a distance and perceive the lines between themselves and other performers.

7.3.3. Distance between the Viewers and the Representational panel

In most full-body interactive installations the viewers look at a display screen located a few feet a way. Sester's *Access* (2003) breaks that convention by using a dynamic representational panel. The tracking system randomly selects one of the visitors at the Siggraph 2003 exhibition and projects a spot light on that person. Here, the circle of the spot light is the representational panel and it tracks the hapless and usually unwilling performer running around. As the selected performer runs among the visitors, the representational panel moves with the performer and the distance between visitors and the representational panel constantly changes.

Figure 7.3.3.1 The use of dynamic representational panel in *Access* (2003), http://www.accessproject.net/

The representational panel is also dynamic in digital performance pieces that use head-mounted displays. However, the viewers cannot see what the performer is seeing in his or her head-mounted display. In such cases, even though the distance between viewers and the representational panel is not static, this dynamism does not make a dramatic contribution.

7.3.4. Distance between the Viewers and the Performers

In *Shadow Monsters* (2005), *Messa Di Voce* (2003), *Electronic Mirror* (1993), *Wooden Mirror* (1999), and *KidsRoom* (1996), the presence of a fixed camera and a fixed response panel establishes definite regions for interaction between viewers and performer. In *Access* (2003), on the other hand, the performer and the representational panel can move so the distance between the performer and the viewers is dynamic. The viewers, however, have no agency to change the status of the interaction. If viewers had such agency, the dynamic distance between viewers and the performer would have contributed to the playfulness of this act.

As the distance among camera, representational panel, viewers, and performers gains dynamism, the amount of freedom for using full-body interaction increases. This

kinesthetic freedom supplies more agency to viewers, to the performer, and to the digital media artist who designs the interaction.

7.4. Physicality: Rudimentary Use of Props in Digital Installations

The set of a full-body interactive installation enables performers and viewers to use actual objects for interacting with the environment. For example, in *Text Rain* (1999) performers can use any kind of object, such as their caps, to collect the falling letters and can then use a wide fabric remnant to bounce or enfold the letters.

Prop is the abbreviated form of the word property and it is an element of décor or costume that has a narrational function. In film production and film criticism, a set of narration tools distinguishes the use of props and costume. For example, a belt on the belly is a piece of costume while the character is wearing his pants. Yet, when the belt is used in a murder, it becomes a prop. Props affect the causality of the narrative.

Tim Burton's *Edward Scissorhands* (1990) exemplifies an intricate use of prop that blurs the distinctions between character, prop, and costume. In this movie Edward's hands are made of scissors (see Figure 7.4.1). Even though Edward's scissor hands take actions that alter the causality of narrative, they are neither costume nor prop. The scissor hands are part of the character. At the end of the movie, however, when Edward's girlfriend takes hold of one of his scissor hands and uses it to kill her own evil ex-boyfriend the scissor hand, at that moment, becomes a prop.

Figure 7.4.1 The hands of Edward are an example of an intricate use of prop in film, http://newsitemstoday.today.com/2009/03/08/edward-scissorhands-by-tim-burton-society-in-our-times/.

Full-body interactive installations are rarely used for storytelling. Consequently, existing full-body interaction installations do not rely on props for storytelling purposes and do not introduce the intricate use of props found in the film medium. The majority of computer-vision-based artworks create instantaneous, non-narrative, entertaining or challenging, single-gag-based moments around a concept. Thus, they resemble single frame comics. The following installations illustrate the use of computer vision for non-narrative interaction.

In Worthington's *Shadow Monsters* (2005), performers create monsters with the projection of their hands (see Figure 7.4.2). In Levin and Lieberman's *Messa Di Voce* (2003) (Ital., "placing the voice"), an audiovisual performance (see Figure 7.4.3), the system creates visual reactions to the voices of the performing actors. In Rokeby's *Watched and Measured* (2000), the surveillance system placed in the London Science Museum selects human heads to investigate according to a set of visual criteria (see Figure 7.4.4). In Khan's *Finger Prints* (2003), the performer creates cloudy lines with his

or her fingers (see Figure 7.4.5). In Moeller's *Cheese* (2000) six actresses try to keep a smile on their faces as long as they can (see Figure 7.4.6). An emotion recognition system measures the smiles of the performers. When a performer's smile falls below a certain threshold, the actors get an audio signal to show more effort by smiling more enthusiastically. In Lozano-Hemmer's *Standards and Double Standards* (2004), fifty buckled belts are suspended from the ceiling of the exhibit room. The belts react to the movements of a visitor by turning clockwise and counter clockwise, thus portraying group dynamics (see Figure 7.4.7). In Moeller's *Electronic Mirror* (1993) the participant can see herself only from a certain distance (see Figure 7.4.8). Jeremijenko's *Suicide Box* (1999) (see Figure 7.4.9) detects and records the vertical movement on the Golden Gate Bridge and challenges the numbers about suicide rates that the San Francisco Port Authority has released. In Utterback's *Text Rain* (1999), participants can bounce falling letters with their full-body motion (see Figure 7.4.10). In Utterback's *Untitled 5* (2004), a performer can make an abstract painting with her full-body movement (see Figure 7.4.11). In Hieronymi's *Pillow Fight* (2004), two participants paint their part of the screen by holding up and moving pillows in front of the camera (see Figure 7.4.12-7.4.13). The participant who paints the screen most fully wins the competition.

Figure 7.4.2 Worthington's *Shadow Monsters* (2005), www.worthersoriginal.com/viki/

Figure 7.4.3 Levin and Lieberman's *Messa Di Voce* (2003), http://www.tmema.org/messa/messa.html

Figure 7.4.4 Rokeby's *Watched and Measured* (2000), http://homepage.mac.com/davidrokeby/wm.html

Figure 7.4.5 Khan's *Finger Prints* (2003), http://www.osmankhan.com/fingerprints/index.html

Figure 7.4.6 Moeller's *Cheese* (2000), http://www.design.ucla.edu/gallery/faculty_gallery.php?ID=75

Figure 7.4.7 Lozano-Hemmer's *Standards and Double Standards* (2004), http://www.flong.com/texts/essays/essay_cvad/

Figure 7.4.8 Moeller's *Electronic Mirror* (1993), http://www.christian-moeller.com/presentation.php

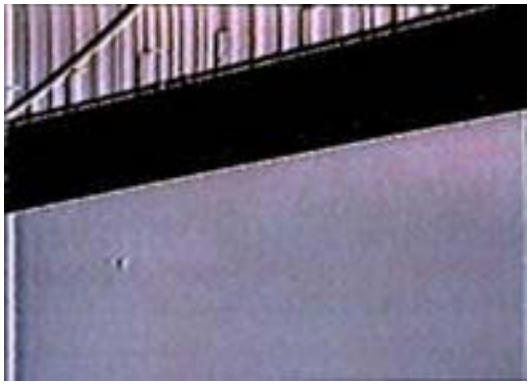

Figure 7.4.9 Jeremijenko's *Suicide Box* (1999), http://www.flong.com/texts/essays/essay_cvad/

Figure 7.4.10 Utterback's *Text Rain* (1999), http://www.camilleutterback.com/textrain.html

Figure 7.4.11 Utterback's *Untitled 5* (2004), http://www.camilleutterback.com/untitled5.html

Figure 7.4.12 Hieronymi's *Pillow Fight* (2004), http://classes.design.ucla.edu/Winter04/256/projects/andrew/body.html

Figure 7.4.13 Hieronymi's *Pillow Paint* (2004), http://classes.design.ucla.edu/Winter04/256/projects/andrew/body.html

This list of non-narrative full-body interactive installations illustrates the current ambition of the medium: instantaneous, non-narrative, entertaining or challenging single-gag-based moments around a concept. The absence of storytelling in full-body interactive installations eliminates the need for the intricate uses of props. Just as tracking people is easy in full-body interactive environments, so tracking objects (props) is trivial. If full-body interactive environments are to be utilized for storytelling purposes, however, the meaning-making potential of props will need to be more thoroughly investigated.

7.5. Conceptual Distance as a Meaning-making Tool in Digital Installations

7.5.1. Benjamin's Concept of Aura

The tangibility notion of the digital performance environments recalls Benjamin's (1969) concept of aura. Benjamin (1969) defines aura as distance-no-matter-how-near. According to his definition, the media such as film and photography that are based on mechanical reproduction alter the uniqueness of an art object produced in a non-mechanical medium such as painting or sculpture. Consequently, the technology of mechanical reproduction diminishes the aura of the art object. However, Bolter et al. (2006) question Benjamin's (1969) concept of aura claiming that "Benjamin (1969) was wrong if he thought audiences and producers would accept a final and irrevocable loss of aura in their popular media forms." (p. 22).

A complete loss of aura in any medium is impossible in that there is always a distance between the medium and the viewer/participant, whether in a real world or a virtual reality environment. Even if the performer is plugged into the medium, as in the case of a virtual reality headset, there will always be a sense of distance between the performer and the environment that she or he is spatially exploring.

In real life, any face-to-face communication includes physical distance. Therefore, each person, in that communication, has his or her own aura. The distance and consequent aura can only be completely lost in a perfect communication state, telepathy, which is impossible to reach. In order to see the mind of the other, the communicator has to be the other. When the communicator becomes the other there is nothing to communicate. All art forms are an attempt at communication. Consequently, as Bolter et

al. (2006) suggested “aura as our collective or individual reaction to art can never simply disappear, as Benjamin seems to have expected” (p. 26).

7.5.2. Winnicott’s Concept of Transitional Object

As paradoxical as it seems, a sense of distance is a must for an immersive experience or a transitional experience. Winnicott’s (1953) concepts of *transitional phenomena* and *transitional object* are the key to explore this paradox. For an infant, who is constructing a self separate from its mother, a transitional object, such as a security blanket, a particular doll, a tune, or a story, helps and supports the infant’s perception of a separate existence by keeping an intermediate space in between the infant and the mother. In the case of transitional objects, the blanket is not a blanket. Instead, it represents the security that the mother supplies. For the infant, the blanket is a part of the mother, substituting for her. Murray (1997) clarifies the paradox of the need for distance in order to attain a strong immersion.

> The power that Winnicott called “transitional” experiences comes from the fact that “the real thing is the thing that isn’t there” In order to sustain such powerful immersive trances, then, we have to do something inherently paradoxical: we have to keep the virtual world “real” by keeping it “not there”. (p. 100)

Winnicott’s (1953) transitional object and Benjamin’s (1969) aura have very similar definitions. Both of them are based on the paradox of distance and immersion: Both concepts point out the fact that the object of desire is unreachable. This paradox takes its most complicated form in the case of a performer’s self-projection, for how can there be distance between one’s self and ones self-projection? Can there be a distance between the performers and their own projections?

7.5.3. Abstracted Self-projections and Distance

Digital performance pieces place the performer in a new world. In this world, the performer has a referent, such as a point of view or a self-projection that represents the performer. Using an abstraction of performer's self-projected image helps to establish the necessary distance required for a strong sense of presence. In *Text Rain* (1999), this abstraction is accomplished through absurdity: even though the self-projections of the performers are almost mirror images the absurdity of the composed visuals, with letters falling down onto the performers, creates the distance. In Mateas' and Stern's *Façade* (2002), the performer is represented by a point of view so that the absence of the performer's self-projected image supports the creation of distance. In *KidsRoom* (1996), a child's projection appears as a purple monster repeating that child's actions. Overall, even if there is a mirror image used in a digital performance, distance is still there. As long as the performer is aware of the presence of a projection, there will be a distance.

7.6. Conclusion

1. In full-body interactive installations, the distances among the camera, the performer, the viewers, and the representational panel are related to each other in more complex ways than is possible in film. However, most full-body interactive installations use a fixed camera and a fixed representational panel in order to manage this complexity.
2. When the camera and representational panel become mobile rather than stationary, this mobility supplies viewers and performers more agency and freedom to use their full-body motion in their interactions with the environment. A wide representational panel on which performers can walk can also increase the agency of the performers.

3. The absence of storytelling in full-body interactive installations eliminates the intricate uses of props in that medium. Just as the tracking people and gestures is possible, so too is the tracking of objects (props). If full-body interactive environments are utilized for storytelling purposes, the ability to track objects in full-body interactive environments must be developed.

4. In order to achieve immersion, a conceptual distance between the performer and the performer's self-projection is necessary. Using an abstracted self-projection image is one of the ways of implementing this necessary distance and establishing a strong sense of presence.

CHAPTER 8

FULL-BODY INTERACTION INSTALLATIONS: THE BOUNDARY OF ILLUSION

8.1. Introduction

Creating and destroying illusion are important methods of making meaning in all art forms. Film narration depends upon identification, verisimilitude, and self-consciousness to sustain and shatter illusion. In parallel, theatrical narration relies on the concept of the fourth wall and the experience of alienation. Digital performance art is informed by aspects of film and of improvisational theater. The majority of digital performance pieces include a panel to post responses on that resembles the white screen in a movie theater or the invisible wall between actors and viewers in a proscenium theatre. The participatory qualities of the digital performance pieces are similar to those of improvisational theater and performance art. Consequently, digital performance pieces can have a more complex and dynamic structure than either film or performance art. However, the procedurality of digital media gives the digital media artist control of this complexity.

In this chapter, I will first define the terms that are needed to discuss creating and breaking illusion in digital performances: identification, alienation, achieving self-consciousness, verisimilitude, and the fourth wall. Then, I will discuss in detail the methods of creating and destroying self-consciousness in film. Third, I will illustrate the insufficiency of the term, fourth wall, as applied to creating, maintaining, and breaking illusion in an improvisational theater and digital performances. I will redefine fourth wall

as the boundary of illusion for improvisational theater and digital performance pieces. Finally, I will summarize the methods of making meaning through the use of this boundary of illusion in digital performances.

8.2. Definitions

8.2.1. Identification

According to Metz (1975), primary cinematic identification is concerned with the spectator's identification with the act of looking itself. "[T]he spectator *identifies with himself*, with himself as a pure act of perception (as wakefulness, alertness): as condition of possibility of the perceived and hence as a kind of transcendental subject, which comes before every *there* is" (p. 788). In other words, primary identification depends upon the spectator's awareness of his or her own absence from the screen and is a necessary condition for the development of secondary cinematic identification. Metz (1975) defines secondary cinematic identification:

> As for identifications with characters, with their own different levels (out-of-frame character, etc.) they are secondary, tertiary cinematic identifications, etc; taken as a whole in opposition to the simple identification of the spectator with his own look, they constitute together secondary cinematic identification, in the singular. (p. 58)

As a form of secondary cinematic identification, a spectator identifies with a character or with many characters at the same time, while also identifying with the camera. In this chapter, the term identification refers to secondary cinematic identification: the spectator's attachment to characters and camera movements and the resulting imaginary access to the movie or digital artifact that such attachment produces.

8.2.2. Alienation

Brecht (1957) defines the alienation effect (verfremdungseffekt) as a desirable theatrical and cinematic device that causes an interruption in the process of identification. According to Brecht (1957), the alienation effect “prevents the audience from losing itself passively and completely in the character created by the actor, and which consequently leads the audience to be a consciously critical observer" (p. 91). In other words, the alienation effect makes the viewer self-conscious about the film viewing process.

8.2.3. Self-consciousness and Reflexivity

Definitions of self-consciousness and reflexivity vary. According to Stam (1985) “[r]eflexivity … points to its own mask and invites the public to examine its design and texture” (p. 1). Stam (1985) defines reflexivity in cinema as “films which point to their own factitiousness as textual constructs.” (p. 1). Similarly, Bordwell (1993) defines self-consciousness in cinema as “the extent the narration displays a recognition that it is addressing an audience” (p. 58). Stonehill (1988) defines self-consciousness in novels as “an extended prose narrative that draws attention to its status as a fiction” (p. 3). The combination of all these definitions offers a definition of self-consciousness visible narration: the fiction makes the narrator, audience, or narration visible. As a result, if a movie or novel exhibits a self-conscious moment viewers will remember that they are watching a movie become momentarily alienated and lose identification with the characters in the film.

8.2.4. Verisimilitude

Chatman's (1990) concept of verisimilitude further defines alienation and identification in film and performance act. According to Chatman (1990) audiences come to recognize and interpret the conventions of a particular genre by "naturalizing" them, a process he calls verisimilitude. When, however a convention, theme, or iconography from one genre is placed into another genre, a state of self-conscious viewing is created and verisimilitude is interrupted. For example, an image of flying people, a convention that is both believable and expected in science fiction, would interrupt credibility and destroy verisimilitude in a costume drama.

An audience constructs a genre-specific reality based on an established and accepted set of paradigms or laws. If something consistent with this is presented to the audience, it is not necessary to define new paradigms. But if a new concept of reality is created, as happens in science fiction, a connection between the accepted and existing reality of the genre and this new reality must be established. Thus, over time, each genre builds up its own concept of reality, guided and constrained by a consistent set of genre specific laws. In this way, an audience constructs a sense of verisimilitude by watching multiple films in the same genre.

In an animation movie, viewers are not surprised when a character who is hit by a car and flattened pops back up to his normal form and continues his actions. The use of this same convention in any other genre would destroy verisimilitude. The animation genre is unique, however, in that everything is possible and there is no requirement for defining paradigms. Consequently, the strategies of the creation of self-consciousness in

movies and digital installations should be considered in relationship to the concept of verisimilitude.

8.2.5. Fourth Wall

The roots of the concept of the fourth wall concept can be found in the eighteenth century writing of Denis Diderot. Gallaretti (2006) quotes from Diderot: “Whether you are writing or acting give no more thought to the spectator than you would if he did not exist. Imagine on the edge of the stage, a great wall that separates you from the auditorium; act as if the curtain had not risen” (p. 208). In his column in *The New York Times*, drama critique Vincent Canby (1987), further defines the fourth wall as “that invisible screen that forever separates the audience from the stage” (¶ 12).

Breaking the fourth wall, alienating the viewer, creating self-consciousness, and destroying verisimilitude are all have the effect of rupturing the identification process and can be used intentioanlly for the purpose of meaning-making. For example, Woody Allen’s *Deconstructing Harry* (1997) portrays a film-making scene. During the shooting, one of the actors, Mel, becomes out of focus in real life while all other people on the set seem clear (See figure 8.2.1). One of the technical assistants checks the camera lens (see Figure 8.2.2) to see if there is anything wrong with the camera. Allen places the viewers on the other side of the lens and we see, in a close-up shot, the technical assistant gazing through the lens toward us. That gaze breaks the fourth wall while the actor-out -of-focus establishes the alienation effect. Since there is no logical explanation for Mel’s fuzziness the viewer experiences a sense of absurdity that destroys verisimilitude. All together, these strategies create self-consciousness by reminding us the presence of a medium for creating fiction.

Figure 8.2.1 Mel becomes out of focus in *Deconstructing Harry* (1997). The screen shot is captured from the youtube video, http://www.youtube.com/watch?v=g0FSYKcV2Mk.

Figure 8.2.2 A technical assistant checks the camera lens with a flash light. The screen shot is captured from the youtube video, http://www.youtube.com/watch?v=g0FSYKcV2Mk..

8.3. The Maker's Perspective, the Viewer's Perspective, and the Historical Context

Whether an artifact is self-conscious or not can be decided by considering three components: the maker's perspective, the viewer's perspective, and the historical context. Winsor McCay's animated movie, *Gertie The Dinasour*, which was produced in 1914, illustrates the trickiness of such analysis. The movie contains McCay himself as the creator of Gertie as well as scenes in which he interacts with his creation by giving her orders. The live action sequences of the movie show the production process of the animated sequences. In these live action sequences, McCay goes to a museum; sees a dinosaur skeleton; has a bet with his friends that he can make a dinosaur move; orders tons of paper and gallons of ink; draws thousands of frames; and finally meets with his

friends to show that he has created an animation, thereby winning the bet. Through this live action sequence, the movie refers to its creation process and draws attention to its status as a fiction. Moreover, the movie, produced in 1914, displays the characteristics of all early film: it is shot in black and white; the cuts are jumpy; and the dialogue was represented by inter-titles. Even though the movie contains almost all items of self-conscious narration, it is hard to define *Gertie The Dinasour* as a self-conscious movie when the historical context is considered.

First of all, when the movie was made the film medium was not even twenty years old. Twenty year is hardly enough time for a medium to criticize itself with self-conscious narration, especially in a context where film conventions have yet to be established. Secondly, as Crafton (1982) explains, the first animated movies emerged from vaudeville's flash sketch tradition. In this context, then, early animators' inclusion of themselves on film, was a nod to tradition rather than a criticism of an established convention. In this way, an old movie may appear as self-conscious because of its use of old technology, rather than because of the intention of the director. Analysis of self-consciousness and reflexivity requires not only consideration of the director's and viewers' points of view, but also consideration of the historical context. Because of these reasons, the significance and the definition of self-consciousness and reflexivity in a specific medium are always in flux.

8.4. Self-consciousness in Film and Animation

Filmic narration may acknowledge its status as a fiction in many ways: by explicitly including the director; by bringing the filmmaker in front of the camera; by suddenly emphasizing film form and its components; by playing with conventions in

order to disappoint the audience's expectations; by showing the very construction of the film; by showing the filmic equipment; by making the actors gaze directly at the audience; by including the audience in the film; by commenting on the film industry, film studios, other actors; and, finally, by referring to another film.

Animation relies on these same techniques to create self-conscious narration. However, the basic tools of animation--paint, ink, paper, and eraser –differ from those of a live action film. As a result of this difference, an animated movie can be self conscious in ways that a live action film cannot. In *Who Framed Roger Rabbit?* (1988), for example, basic tools of the animation medium (an editing tool, moviola and a chemical mixture containing turpentine, acetone, benzene for cleaning lines, DIP) are used as lethal weapons within the storyline, making self-conscious reference to the medium of animation.

8.5. Revision of the Term Fourth Wall for Improvisational Theater and Performance Art: The Boundary of Illusion

The term fourth wall is insufficient to explain some of the dynamic structures in improvisational theater and in performance art, where audiences can move around and participate in the story creation. In film and animation, the fourth wall is the boundary implied by the rectangular static screen (see Figure 8.5.1). In the proscenium theater, the fourth wall is an invisible-rectangular-static wall between the stage and the viewers. The audience in film, animation, and the proscenium theater is non-participatory, passive, and static. Improvisational theater and performance art may be performed in public places where audiences can walk among the actors, eliminating the invisible-rectangular-static wall (see Figure8.5.2) that separates audience and stage.

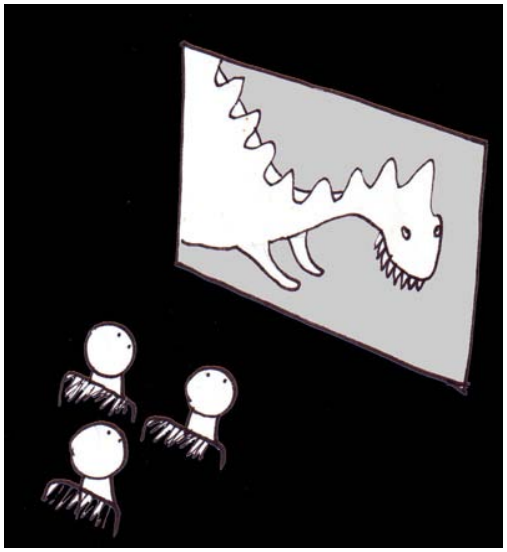

Figure 8.5.1 Rectangular unique fourth wall in a movie theater

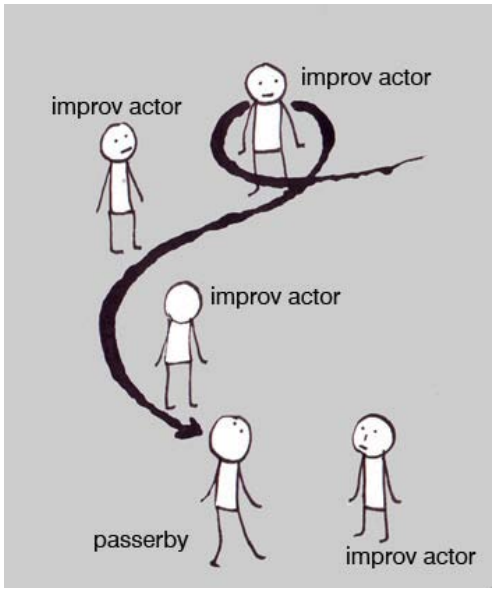

Figure 8.5.2 Difficulty of defining fourth wall in an improvisational theater act

The motionless audience and the rectangular screen or invisible wall of proscenium theater, film, or animation reduce the number of variables that affect the breaking of illusion via the fourth wall in these media. In contrast, there are multiple and mobile fourth walls in improvisational theater and performance art. The fourth walls of

these media are in flux depending on the changing positions and the agency of the audience. As a result, the fourth wall term defined in the eighteenth century for the proscenium theater is not sufficient to describe the multiple fourth walls created by the participatory and mobile audiences of improvisational theater and performance art. The analysis of such dynamic and novel structures requires a novel term: “the boundary of illusion.”

The following example illustrates the dynamic nature of the boundary of illusion in improvisational theater. The New York-based improvisation group *Improv Everywhere* involved 207 Improv Everywhere Agents in their *Frozen Grand Central* show. All 207 agents simultaneously froze in place for five minutes in the Main Concourse of Grand Central Station while passersby tried to make their way around the human obstacles and understand the mystery (see Figure 8.5.3). A single passerby, who is exploring four frozen agents by walking around them, creates a boundary of the illusion (fourth wall) that is in flux and that is not flat.

Figure 8.5.3 An audience member walking among four frozen Improv Everywhere Agents. I added the labels. http://improveverywhere.com/2008/01/31/frozen-grand-central/

Each passerby creates an individual boundary of illusion out of the contents of his or her field of vision. In participatory performance and improvisation events where the viewer can move, these boundaries of illusion may be discrete, overlapping, or inclusive.

Using the *Frozen Grand Central* show as an example, two passersby looking at different frozen agents located far from each other constructs discrete boundaries of illusion (see Figure 8.5.4). Two passersby standing next to each other and exploring two frozen agents who are also standing close to each other have overlapping boundaries of illusion (see Figure 8.5.5). A passerby watching the event from a higher view point has an inclusive boundary of illusion, one that contains the boundaries of illusion of all other passersby randomly distributed across the space (see Figure 8.5.6).

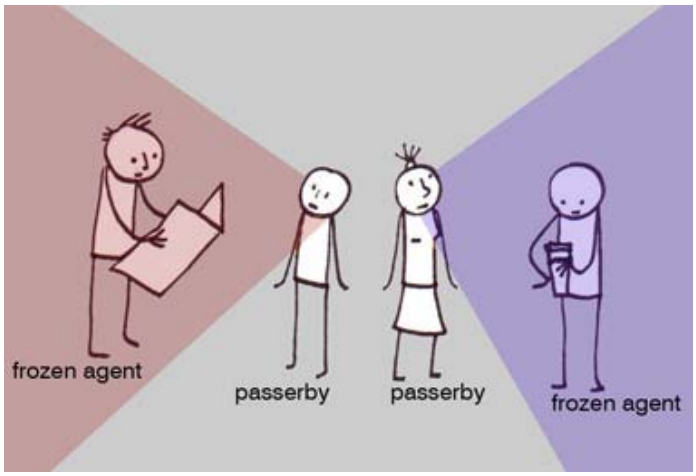

Figure 8.5.4 Discrete boundaries of illusion

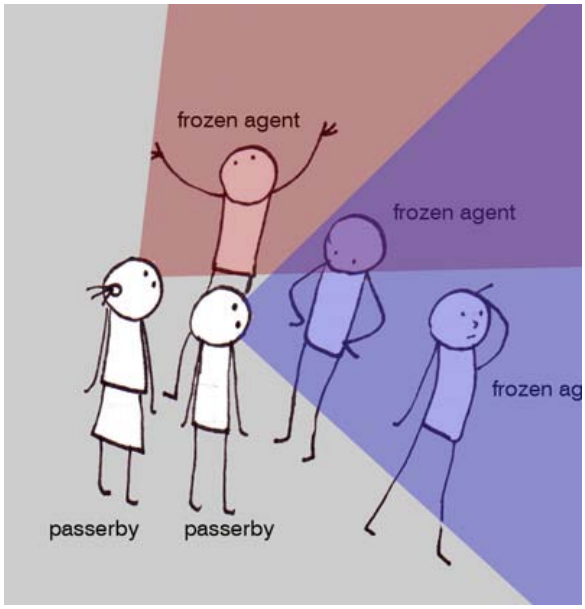

Figure 8.5.5 Overlapping boundaries of illusion

Figure 8.5.6 The point of view in the photograph indicates an inclusive boundary of illusion, http://improveverywhere.com/2008/01/31/frozen-grand-central/

A nested boundary of illusion is a specific and organized case of the inclusive boundary of illusion. In a nested boundary of illusion, the performers are related in a nested way. For example, (see Figure 8.5.7): a toddler watching a commercial on television and dancing; toddler's mother smiling while watching her dancing son; and the grandmother watching her smiling daughter.

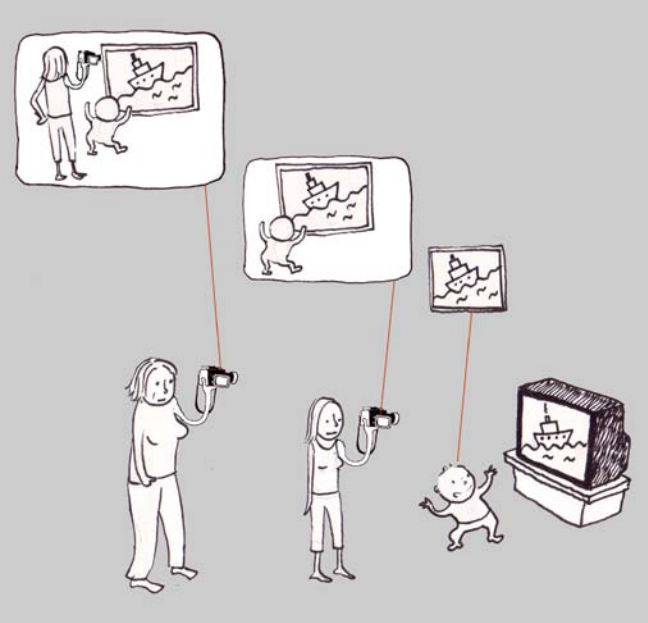

Figure 8.5.7 Nested boundaries of illusion

Since the toddler and mother are in the grandmother's field of vision, their actions will affect the grandmother's boundary of illusion. However, unless the grandmother interacts with mother and toddler by penetrating their boundaries with her voice or by entering their fields of vision, these three people constitute a nested boundary of illusion.

8.6. Discrete, Overlapping, Inclusive, and Nested Boundaries of Illusion in Digital Performance

The fourth wall notion takes its most complex form in digital interactive installations. Like improvisational theater, digital interactive installations can offer mobility and agency to the participants. In addition to this, the majority of digital interactive installations include a response panel, a derivation of the screen in film and animation and of the invisible wall in the proscenium theater. Consequently, the boundary of illusion in digital interactive installations includes qualities of the fourth wall from film, animation, and the proscenium theater, as well as qualities of the boundary of

illusion from improvisational theater. The procedurality of digital media makes the boundaries of illusion even more dynamic and gives the digital media artist a wider set of options for meaning-making. Similar to the boundary of illusion in improvisational theater the boundary of illusion can be in digital performance discrete, overlapping, or inclusive.

8.6.1. Discrete Boundaries of Illusion

Two people at different locations playing *Second Life* (2003) at the same time share the same illusion space. However, if they do not meet in the same location, in the game world, each discrete player will have different content on his or her monitor. The player's monitors, then, serve as boundaries of illusion. Since the contents of their screens are different, their boundaries of illusion do not intersect (see Figure 8.6.1.1 and 8.6.1.2).

Figure 8.6.1.1 Player A's screen: Player A's avatar is shopping, http://www.gameogre.com/reviewdirectory/reviews/Second_Life.php.

Figure 8.6.1.2 Player B's screen: Player B's avatar is leaving his office, http://www.gameogre.com/reviewdirectory/reviews/Second_Life.php.

8.6.2. Overlapping Boundaries of Illusion

Two users interacting around a multi-touch table, on the other hand, have overlapping boundaries of illusion, sharing the same screen for their interaction. A multi-touch table screen is different from a film screen because it allows participation. While interacting with a multi-touch table, the boundary of illusion is dependent on images on the screen and on the users' actions (see Figure 8.6.2.1).

Figure 8.6.2.1 A female and male user interacting with Microsoft multi-touch table. Screenshot is captured from http://www.youtube.com/watch?v=PbqS9x7sBZA

Two users, one male and one female, interacting with *Microsoft Surface* will have overlapping but slightly different fourth walls. The female user will see her own hand,

her male counterpart's hand and body, and the multi-touch screen. If the male user happens to be wearing a t-shirt that has "Microsoft Sucks!" written on it, his costume choice will break the illusion of transparency that the multi-touch table offers (see Figure 8.6.2.2). Similarly, the male user will see his own hand, his female partner's hand and body, and the multi-touch table. If she happens to interact with the *Microsoft Surface* by licking the table, her act would break a convention about interacting with a multi-touch table (see Figure 8.6.2.3) and interrupt the illusion. Her unconventional interaction act would be in the male user's visual field and alienate him in the Brechtian sense. Although, the multi-touch surface is viewed common by both users, they each see the other as performer: In this way, their boundaries of illusion overlap but are not identical.

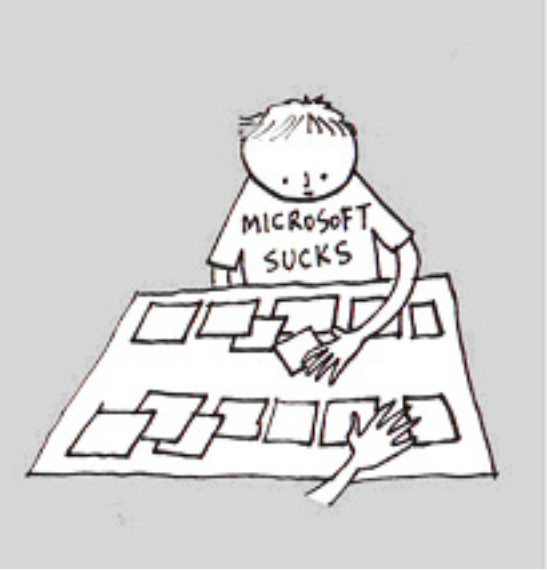

Figure 8.6.2.2 Female participant's boundary of illusion: her hand, her male counterpart, the interactive surface

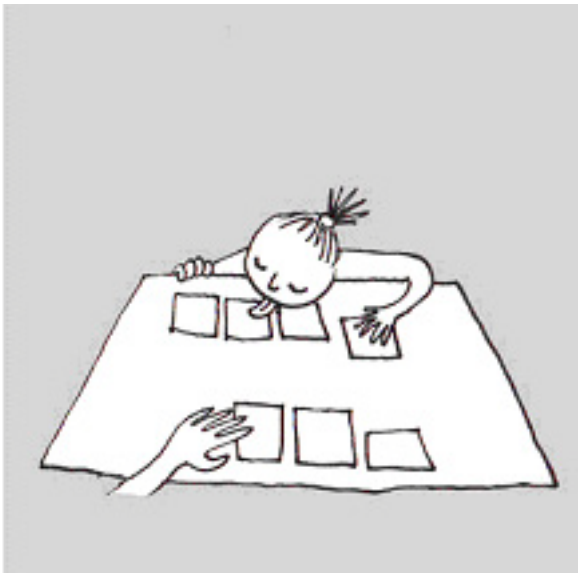

Figure 8.6.2.3 Male participant's boundary of illusion: his hand, his female counterpart, the interactive surface

8.6.3. Nested Boundaries of Illusion

The concept of boundaries of illusion in digital interactive installations shares a set of common qualities with those of improvisational theater. However, in contrast to improvisational theater, the use of digital media in a performance act enables the artist to control and organize the randomly distributed boundaries of illusion and bring them to a nested state. For example, in *Abundance* (2007), Camille Utterback generates animation on the façade of the 3-story cylindrical rotunda. The animation responds to the movement of each person walking around the City Hall Plaza in San Jose, California. (see Figure 8.6.3.1).

Figure 8.6.3.1 *Abundance* (2007), http://www.camilleutterback.com/abundance.html

The audience's point of view implied in the photograph (see Figure 8.6.3.1) has an inclusive boundary of illusion. Different from the inclusive boundary of illusion in *Frozen Grand Central Show,* in *Abundance* (2007) everyone's attention is directed toward a single interactive screen (see Figure 8.6.3.1) instead of toward randomly distributed frozen agents (see Figure 8.5.6). Thus, in *Abundance* (2007), the interactive screen creates nested boundaries of illusion.

Similar to the boundaries of illusion in *Abundance* (2007), the boundaries of illusion in *Text Rain* (1999), *Embodied Comics: Egg's Journey* (2007), *KidsRoom* (1996), and *Wooden Mirror* (1999) are nested because they too use interactive screens. However, each of these installations also supports discrete and overlapping boundaries of illusion. The boundaries of illusion are in flux in relation to participants' direction of attention and can be overlapping, discrete, and nested during the course of interaction. For example, in *Abundance* (2007), a visitor standing at the very front row close to the screen may prefer not to pay attention to the screen. Instead this visitor may turn her back on the screen and look at the people running and jumping around in order to interact with the screen (see

Figure 8.6.3.2). In this case, this visitor breaks the nestedness. Her boundary of illusion intersects or overlaps with those of others.

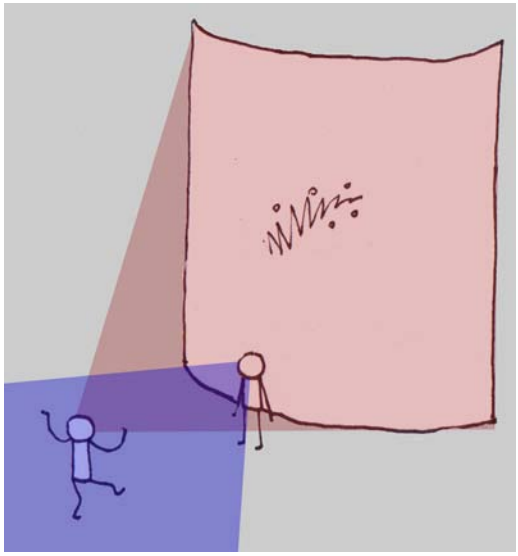

Figure 8.6.3.2 Overlapping boundaries of illusion in *Abundance* (2007)

8.7. Meaning-making with the Boundary of Illusion in Digital Performances

8.7.1. Nested Boundaries of Illusion and Agency

The concept of nested boundaries of illusion is a fertile concept for meaning-making in full-body digital performances. Even though existing full-body installations make an attempt to use this potential, most have limited themselves by giving all participants the same agency.

In *Abundance* (2007), for example, everybody can move and see the corresponding animation on the screen. In *Text Rain* (1999), everybody can bounce the letters. In *Wooden Mirror* (1999), every participant creates a self reflection by moving in front of the wooden screen. In these examples, the boundaries of illusion are nested in a monotonous way. In other words, there is not a dynamic relationship among the nested levels depending on differences of agency and range of knowledge. The following

example illustrates this monotonous structure. In *Abundance* (2007) the participants A, B, and C are sequenced (see Figure 8.7.1.1): A stands closest to the screen. B is behind A. and C is behind B. The boundary of illusion for Participant A is the interactive screen. The boundary of illusion for Participant B is Participant A's actions and the interactive screen. The boundary of illusion for Participant C is Participant A and Participant B's actions and the interactive screen.

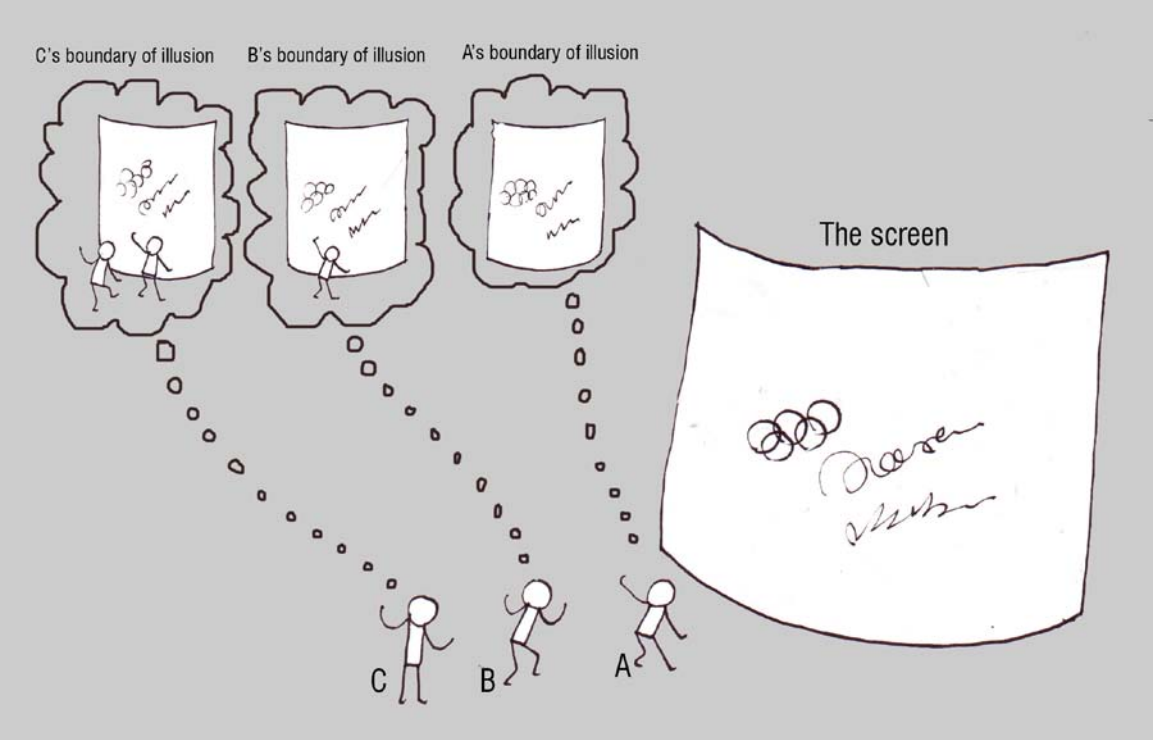

Figure 8.7.1.1 Nested and repetitive boundaries of illusion in *Abundance* (2007) with every participant having the same kind of agency

Although *Abundance* (2007) generates nested boundaries of illusion the boundaries are fixed and monotonous because each participant has exactly same kind of agency.

8.7.2. Rejecting and Redefining the Established Conventions

Rozin's *Wooden Mirror* (1999) breaks and redefines the convention of a reflective two-dimensional screen. In his system the digital input captured via a webcam

turns into an analog output via a kinetic screen made of wooden pixels (see Figure 8.7.2.1). The gradually degrading surfaces of turning wooden blocks supply the required range of contrast for comprising the participant's mirror image. During the image composition the participant actually hears the sound that the turning wooden material makes. The unconventional way in which the reflection is composed and the sound accompanying it bring the presence of the medium to the participant's attention. In this way, the participant's awareness of the medium breaks the illusion that the participant's self reflection on the screen creates.

Figure 8.7.2.1 *Wooden Mirror* (1999), http://bridell.com/tag/installation/

Manipulation of the distance between the performer and the response panel may also redefine conventions, as this distance has an impact on the boundaries of illusion. For example, in *Text Rain* (1999), the participants interact with the screen by standing at least 1.5 feet away from it (see Figure 8.7.2.2). This distance allows the creation of nested boundaries of illusion.

Figure 8.7.2.2 *Text Rain* (1999), http://www.camilleutterback.com/textrain.html

In contrast, in Snibbe's *Boundary Functions* (1999), performers walk on the response panel where they see the dynamic lines that separate each performer from the others (see Figure 8.7.2.3), creating a distance of zero between the performers and the response panel.

Figure 8.7.2.3 *Boundary Functions (1998),* http://snibbe.com/scott/bf/

It is harder to establish a structure based on nested boundaries of illusion in a full-body interactive environment such as *Boundary Functions (1998)* where there is no distance between the performers and the response panel.

8.7.3. Making the Code and Computer Visible

Just as a director may create self-consciousness in film by showing filmic equipment such as cameras, lights, and microphones, so a digital artist may break the boundary of illusion by emphasizing the code and the computer in a digital artifact.

For example, the official web site of Darren Aronofsky's *Requiem for a Dream*, (2000) operates in an unconventional way and exhibits a self-conscious/self-reflexive quality. As the browser tries to upload a page from the web site, the web site seems to crash by showing <html> code lines, error messages, gif symbols, blank pages, pop up windows, and low quality advertisement banners (see Figure 8.7.3.1). This emphasis on components of a web site reminds visitors that they are reading a web site and interrupts their exploration. As a result, they are unable to experience immersion or get pure information about the movie and become alienated.

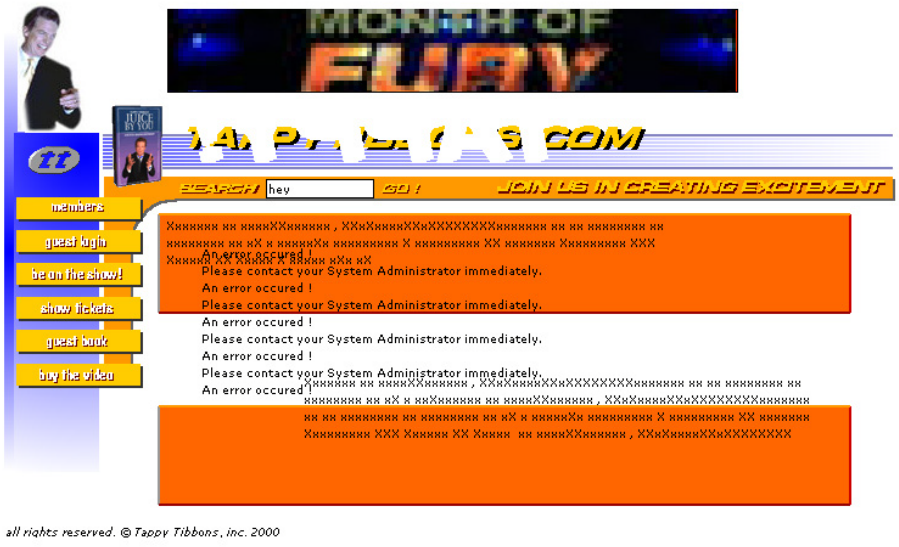

Figure 8.7.3.1 A screen shot from the official site of *Requiem for a Dream*, (2000), includes error messages as a part of web design, http://www.requiemforadream.com/.

This way of breaking the boundary of illusion maybe contrasted with techniques used in other installations such as Snibbe's *Boundary Functions* (1998), in which the computer and monitor are hidden in a closet or behind a blind (see Figure 8.7.3.2) and *KidsRoom* (Bobick et al., 1996) in which the cluster of computers is kept out of the interaction room (see Figure 8.7.3.3). In both of these pieces, the medium itself remains invisible, in accordance with accepted convention and boundary of illusion is not broken.

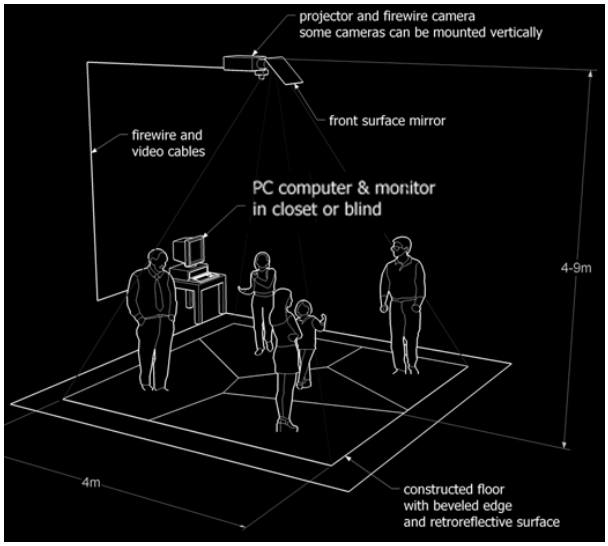

Figure 8.7.3.2 Snibbe aims to hide the computer and monitor in a closet or blind in *Boundary Functions* (1998), http://snibbe.com/scott/bf/

Figure 8.7.3.3 The cluster of computers located outside the *KidsRoom* (1996), http://vismod.media.mit.edu/vismod/demos/kidsroom/kidsroom.html

8.8. Conclusion

A summary of the affordances of creating and breaking the boundaries of illusion in digital performances follows.

1. The theatrical term fourth wall is insufficient to explain the dynamic relationships among performers and audience that occurs in improvisational theater, performance art, and digital performances. The creation of a new term, the boundary of illusion, is necessary.

2. Because the boundary of illusion is influenced by both the position and the agency of the participants, this construct offers a varied set of meaning-making tools to the digital media artist.

3. Boundary of illusion may be characterized as discrete, overlapping, or inclusive.

4. Procedural qualities of digital media give the digital media artist the ability to create and control a specific case of an inclusive boundary of illusion: nested boundaries of illusion. A digital media artist can generate playful interaction environments and interactive narrations in full-body interactive environments by assigning different kinds of agency to the participants, enabling collaboration and varying ranges of knowledge among participants. This phenomenon is illustrated in Chapter 10.

6. Nested boundaries of illusion create a fertile and unexplored area that calls for more attention from digital media artists and scholars.

CHAPTER 9

FULL-BODY INTERACTION INSTALLATIONS: ELASTIC, DYNAMIC, AND EMBODIED FRAME AND CONVENTIONS

9.1. Introduction

In this chapter, I will focus on the convention of frame exploring its use in painting, photography, comics, film, and animation and then examining the ways in which full-body interactive installations revise and transform the conventions associated with frame in these earlier media. I will illustrate my arguments with examples from both the earlier media and from full-body interactive installations.

9.2. Frame Component in Painting, Comics, Photography, Film, and Animation

An artist make meaning by emphasizing the frame component visible in any medium. René Magritte in *La Condición Humana* (1933) playfully makes the presence of the frame and the two-dimensionality of the painting medium visible by making the borders of the canvas in the painting invisible (see Figure 9.2.1).

Figure 9.2.1 Magritte's *La Condición Humana* (1933) makes the frame visible by making it invisible, http://www.rci.rutgers.edu/~jmarcone/

In photography, Christian Milavanoff's work places a framed photograph of huge ocean waves in an office environment (see Figure 9.2.2). The narrowness of the actual photography frame enforces the claustrophobic feeling of an office setting.

Figure 9.2.2 Christian Milavanoff's photograph, http://www.designautopsy.com/blowup/

In film, an emphasis on the frame component alerts viewers to the presence of a main frame (screen), as viewers become aware that they are watching a movie. The extensive use of frame in frame cinematography in *The Hudsucker Proxy* (1994) is illustrated in the following shot (see Figure 9.2.3).

Figure 9.2.3 Frame in frame cinematography is used in *The Hudsucker Proxy (1994).* The screenshot is captured from the movie.

There are several frames sequenced one inside another: the main frame through which the viewers watch the movie, the frame created by walls, the inner-ornamental rods, the corners of the glass on the window, the hole in the glass, and the square light set behind the character constitute six frames sequenced one after another. This use directs the viewer's attention to the character by placing him at the center of all frames. Interestingly, in this piece, the frequent use of frame in frame cinematography is reminiscent of the use of explicit frames in the comics medium.

A similar self-consciousness may be created in the animation medium. In *Duck Amuck* (1953), for example, the character's attempt to hold up the collapsing frame functions as one of many self-conscious moments of the movie (see Figure 9.2.4) and calls attention to the frame component as a comic device. While borders of the frame are collapsing, the animated character's drive for survival draws the viewer's attention to the presence of frame, thus interrupting immersion by focusing viewers' attention on a basic component of the animation medium.

Figure 9.2.4 Duck Amuck fights with the frame. The screenshot is captured form the youtube video, http://www.youtube.com/watch?v=-Os_sDDDXro

In the medium of comics, Lynda Barry's short comic fiction, *Two Questions*, includes an example of making the frame component visible. The unconventional frame she places around the words takes the shape of stairs on which a cat climbs while leaving a trail of poop balls behind. The frame itself becomes a prop-like component, contributing to the humor of the piece (see Figure 9.2.5).

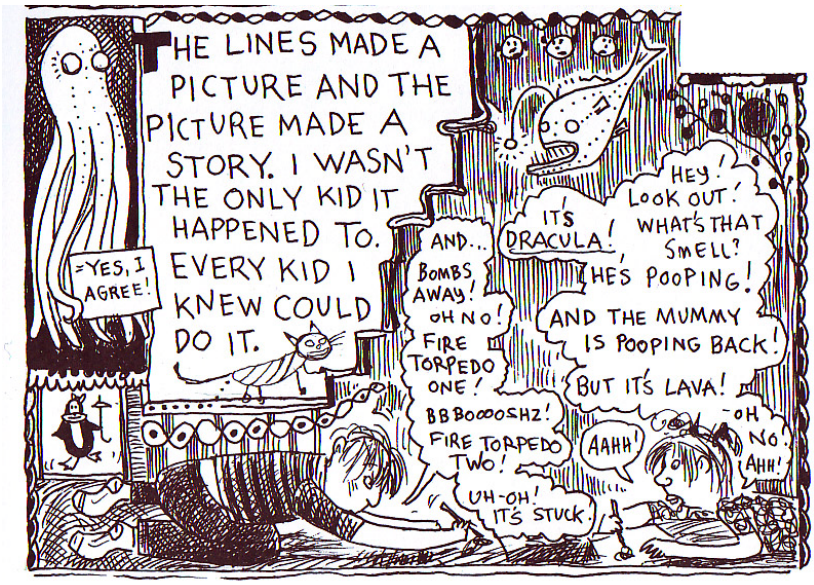

Figure 9.2.5 Lynda Barry's unconventional frame in the shape of stairs in Mc Sweeney's Quarterly No.13 by McSweeney's, E. O. and Ware, C. (2004), (p. 61)

The physical components of a full-body interactive installation usually include a performer or a group of performers, viewers watching the event, a representational panel or projection screen, sometimes an audio system for the response and, a physical space for the performers, wearables/objects, cameras/sensors/microphones, and the computer/processor.

The frame component inevitably becomes a part of full-body interactive installations since the environment's response is generally presented through a frame. Examples follow: *Text Rain* (1999) with a self-projection screen; *Façade* (2002) with the frame of the virtual reality goggles; and *Wooden Mirror* (1999) with the wooden mirror installation. All visual arts, painting, comics, photography, film, and animation strongly rely on the frame component. The full-body interactive installations can remediate the legacy media's frame conventions.

9.3 Elastic, Dynamic, and Embodied Frame in Digital Installations

In full-body interactive installations, frame becomes elastic, dynamic, and embodied. A Web comics artist can also create elastic, dynamic, and participatory frame. However, a Web comics artist will not be able to create an embodied frame. In a traditional PC environment, participation is limited with keyboard and mouse input while in a full-body environment the performer can use his or her entire body to interact with the frame.

Scott Snibbe in his full-body interactive installations uses the frame component by rendering it visible. In *Compliant* (2002), the performer can push and bend the elastic borders of a frame while the shiny frame slides on the projection screen like a piece of ice (see Figure 9.3.1).

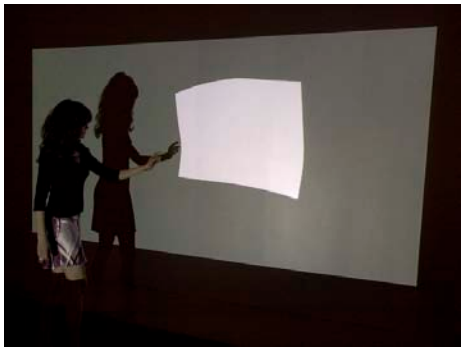

Figure 9.3.1 Snibbe's *Compliant*, (2002), http://snibbe.com/scott/screen/compliant/stills.html

In my reading of the piece, *Compliant* (2002) points to the impossibility of capturing the essence of the moment with any medium. Even though performers can manipulate the frame they cannot catch it.

Figure 9.3.2. Snibbe's *Boundary Functions* (1998), http://snibbe.com/scott/bf/

In *Boundary Functions* (1998), Snibbe plays with the idea of personal space through the concept of elastic frame borders (see Figure 9.3.2). The stripes projected onto the floor act as boundaries between performers and point to the impossibility of perfect communication.

In *Deep Walls* (2003) Snibbe uses multiple split screens (see Figure 9.3.3) to capture and project the movements of different viewers within each of 16 rectangles. The

content of these rectangles is created dynamically, depicting the various people who enter the room over time.

Figure 9.3.3 Snibbe's *Deep Walls*, (2003), http://snibbe.com/scott/mosaics/deep%20walls/deep_walls.html

Moreover, *Deep Walls* has several associations with Zbigniew Rybczynski's famous animated piece *Tango* (1981) (see Figure 9.3.4). In *Tango*, a variety of actions that may take place in a single environment are represented in one frame. Characters enter the room; they perform unrelated tasks; they do not perceive each other; and their paths never intersect.

Figure 9.3.4. These snapshots from Zbigniew Rybczynski's *Tango* (1981) are sequenced in a chronological way in order to explain the flow of the movie, http://www.zbigvision.com/Tango.html.

In *Boundary Functions* (1998) and *Compliant* (2002), the performer can manipulate the elastic frame border. In *Deep Walls* (2003), the performer can manipulate the contents of the frames and the contents of the frame become dynamic. The elastic frame border and dynamic contents of the frame invite the performer to participate in the piece in a playful way, thus making the frame component participatory. In *Duck Amuck* (1953) the frame is also elastic, dynamic, and participatory for the Duck. However, in *Duck Amuck* (1953) unlike *Boundary Functions* (1998) the viewers of the animation have no agency. In Snibbe's work on the other hand, the performer becomes the Duck Amuck and the frame becomes embodied.

The medium of comics has its own set of frame conventions. For example, a wavy frame border indicates that there is a depth of knowledge scene where the thoughts of the character, the character's flashback, or the character's hallucination are revealed (see Figure 9.3.5).

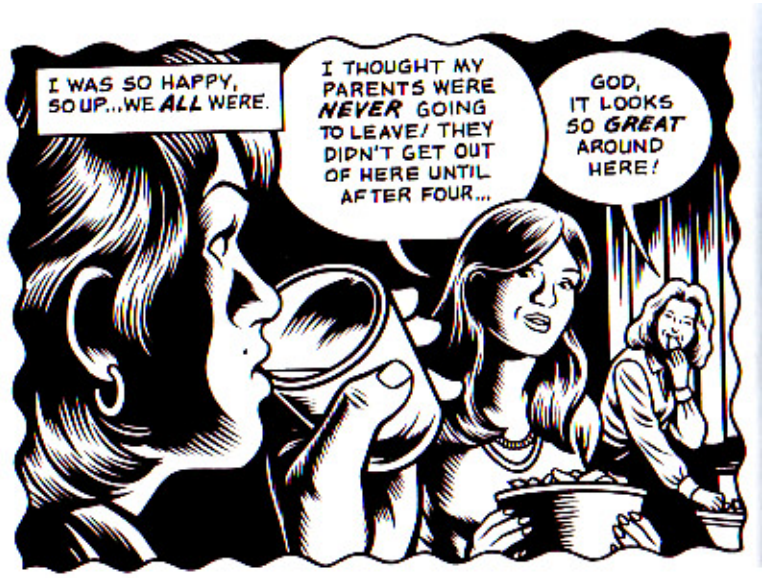

Figure 9.3.5 Wavy frame lines indicates a depth of knowledge scene in Charles Burns *Black Hole* (p. 80).

Additionally, two examples from McCloud's (1986) work explicate ways in which time may be represented through the manipulation of frame. As McCloud explains both the absence of frame borders (see Figure 9.3.6) and an exaggeration of frame width (see Figure 9.3.7) depict the passage of extended amounts of time within a comics piece.

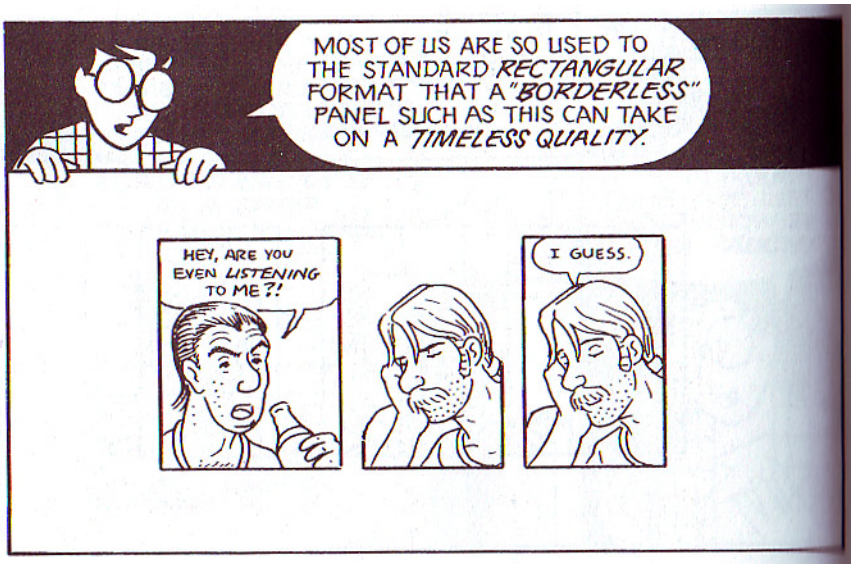

Figure 9.3.6 Borderless frame indicates timeless quality in Scott McCloud's illustration in *Understanding Comics*, (p. 101).

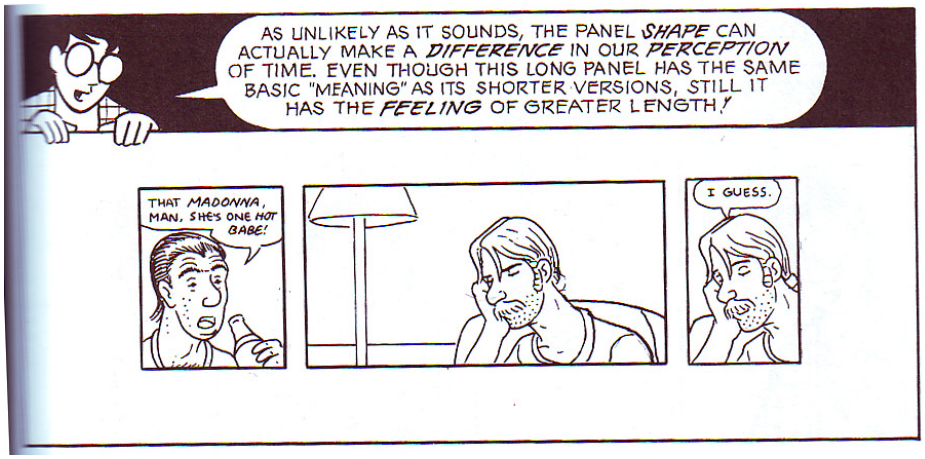

Figure 9.3.7 Length of the panel indicates the duration of time in Scott McCloud's illustration in *Understanding Comics*, (p. 101).

9.4. Dynamic and Participatory Speech and Thought Balloons in Digital Installations

In the medium of comics, the borders of a speech balloon convey the tone of the message. For example in the following frame from Satrapi's *Persepolis* (2004) (see Figure 9.4.1) the jagged borders of the speech balloons communicate the character's

strong emotion. In Thompson's *Blankets* (2003), the cloudy shape of the balloon signifies that it is a thought balloon (see Figure 9.4.2).

Figure 9.4.1 The jagged borders of speech balloons in Marjane Satrapi's(2004) *Persepolis: The Story of a Childhood*, (p. 88)

Figure 9.4.2 Cloudy border indicates a thought balloon, Blankets by Craig Thompson in Craig Thompson's (2003) *Blankets*, (p. 135)

Figure 9.4.3 The use of speech balloons in *Messa Di Voce* (2003), http://www.tmema.org/messa/photos.html

Some digital performance artists have appropriated the speech bubble from the comics medium and transformed it into a convention of their own. For example, Levin's computer-vision-based installation, *Messa Di Voce* (2003), re-contextualizes the function of the speech balloon for a full-body interactive environment (see Figure 9.4.3). Even though Levin does not use the speech balloon component for storytelling purposes he does make use of the relationship of the form of the speech balloon and the emotion being communicated (see Figure 9.4.4 and 9.4.5).

Figure 9.4.4 The use of jagged borders in *Messa Di Voce* (2003), http://www.tmema.org/messa/photos.html

Figure 9.4.5 The use of thought balloons in *Messa Di Voce* (2003), http://www.tmema.org/messa/photos.html

9.5. Dynamic and Participatory Typographic Components in Digital Installations

In printed comics, the typographic components compensate for the lack of the audio element by representing sound effects. The size of the letters, their borders and color inform the viewer about the mood of the sound (see Figure 9.5.1). In a similar example from digital performance act, the tiny colorful letters pouring down into the screen in Utterback's *Text Rain (1999)* (see Figure9.5.2) resemble a comics image conveying a magical moment with the use of words.

Figure 9.5.1 Typographic components indicate sound effects in the medium of comics in Katsuhuro Otomo's (2001) Domu: A Child's Dream, (p. 5).

Figure 9.5.2 Use of typographic components in *Text Rain (1999)*, http://www.camilleutterback.com/textrain.html

9.6. Dynamic and Participatory Movement Lines in Digital Installations

Movement lines indicate action in the medium of comics (see Figure 9.6.1). Even though digital interactive environments may include actual movement, the medium may also benefit from the use of convention of movement lines. In Levin's *Messa Di Voce* (2003), the sound is taken as an input and it is transformed into the movement lines coming out of the mouth of the projected image of the performers (see Figure 9.6.2). These movement lines draw on the convention of speech bubbles as well. In a full-body interactive installation movement lines can really move and respond to the performer's actions.

Figure 9.6.1 The movement lines indicate movement in Craig Thompson's (2003) *Blankets*, (p. 23).

Figure 9.6.2 The use of movement lines in *Messa Di Voce* (2003), http://www.tmema.org/messa/photos.html

9.7. Use of Icons in Digital Installations

Finally, the medium of comics uses icons to communicate. For example, musical notes may indicate that a character is singing, hearts moving out from a character's body

may indicate that he or she is in love (see Figure 9.7.1). Icons may also be used to censor curses and other offensive material (see Figure 9.7.2). In digital environments, Snibbe's *Visceral Cinema: Chien* (2005) uses icons to convey intertextual messages (see Figure 9.7.3). The image of the man dragging the piano is one of the must memorable scenes in Bunuel's *Un Chien Andolue* (1929). Thus, with the use of iconographic representations, digital interactive performances can refer to other texts and benefit from the enormous content that has been previously created by literature, film, and various other art forms.

Figure 9.7.1 The use of icons: music notes and hearts in Lynda Barry's (2002) story titled as *Marly's Love* in *Greatest of Marlys* (page numbers are supplied in the book.)

Figure 9.7.2 The use of icons to censor the curses in Craig Thompson's (2003) *Blankets*, (p. 115)

Figure 9.7.3 The use of icons delivers an intertextual message in *Visceral Cinema: Chien* (2005), http://snibbe.com/scott/visceral_cinema/chien/index.html

9.8. Conclusion

1. Frame is an important component in painting, photography, film, animation, and comics. Full-body interactive installations have appropriated and transformed the conventions about frame component from these earlier media, making it an important meaning-making strategy of their own.

2. Frame is an essential component in comics and animation. When frame is moved to digital performance spaces, it becomes even more powerful because of the procedural and participatory qualities of digital media. Even though the animation medium can supply an elastic and dynamic frame border, digital performances provide the performer with the agency of manipulating the frame border. An elastic, dynamic, and participatory frame border is an extremely powerful meaning-making tool.

3. Other conventions of comics, such as speech and thought balloons, movement lines, typographic components, and icons, become dynamic and participatory as they are used in full-body interactive installations.

4. These new methods of meaning-making are only beginning to be exploited in the creation of engaging digital performance spaces. This is a fertile area for future exploration and creates an exciting invitation to digital media artists.

CHAPTER 10

EMBODIED COMICS: EGG'S JOURNEY EXEMPLIFIES THE MERGER OF CONVENTIONS OF FILM, COMICS, AND PERFORMANCE IN A FULL-BODY INTERACTIVE INSTALLATION

10.1 Introduction

Embodied Comics is a computer-vision-based full-body interactive storytelling environment that may also function as a comics generator. *Egg's Journey* (2007) is a sample interactive story that I designed for Embodied Comics. My collaborator Yanfeng Chen and I built this installation with the supervision of Alexandra Mazalek at the Synesthetic Media Lab at Georgia Institute of Technology.

Most computer vision installations have not been designed for storytelling purposes, though there are exceptions such as *The KidsRoom* (1996). In *Egg's Journey* (2007) we aim to contribute to the closing of this gap and to establish conventions for storytelling within full-body interaction. In this chapter, I describe the Embodied Comics environment and our installation, *Egg's Journey* (2007), and illustrate the utilization of the meaning-making strategies that I have identified in this dissertation in an Embodied Comics environment.

Embodied Comics: Egg's Journey seeks ways of taking digital comics out of the computer screen and merging comics and animation conventions into three-dimensional real space. This installation makes use of the qualities of digital games, interactive narration, digital art, performance, and augmented reality and has been designed with the following narrative, conceptual, and interaction/technical goals.

10.2. Goals

10.2.1. Narrative Goals

- To design a computer vision environment for storytelling purposes rather than for a momentary/attention-grabbing event.
- To utilize the environment as a comics generator by periodically taking snapshots of the happening.
- To create a dynamics of collaboration and rivalry between the performer and the audience by giving agency to both.
- To create an environment where the performer might be teased playfully in order to produce humor.

10.2.2. Conceptual Goals

- To use highly abstracted self-projection to increase the performer's immersion.
- To explore ways of producing new conventions and a new vocabulary for a set of art forms, especially for comics, performance, film, photography, and animation, when they are contextualized in a full-body interactive environment.
- To alter the classical male-centered discourse of reproduction narratives such as active sperm-passive egg.
- To create an environment for public entertainment that aims to make participants confront their stereotypical ways of thinking.

10.2.3. Interaction / Technical Goals

- To create an interaction space for a performance-based activity without using wearables or directly instructing the performer in any way.
- To enable the performer to understand the interaction pattern without using

explicit textual or audio explanations.

- To create short, immersive and physically active experiences by combining virtual and real objects.

10.3. Related Work

While investigating the prior art which makes use of computer vision technology, we found that the majority of computer vision based art is not designed for storytelling, but instead creates instantaneous, non-narrative, entertaining or challenging, single-gag-based inventive moments around a concept. The earlier examples, such asWorthington's *Shadow Monster* (2005), Khan's *Finger Prints* (2003), Hieronymi's *Pillow Paint* (2004), Levin and Lieberman's *Messa Di Voce* (2003), Snibbe's *Body, Screen and Shadow* (2003), Lozano-Hemmer's *Standards and Double Standards* (2004), Rokeby's *Watched and Measured* (2000), Moeller's *Cheese* (2000) and *Electronic Mirror* (1993) resemble single-frame comics and use computer vision for non-narrative interaction.

Among all the art work that we studied, only Bobick's *KidsRoom* (1996) attempted to use the storytelling potential of computer vision based full-body interactive environments. The target participants of *KidsRoom*, however, are children. We are interested in developing a storytelling environment that is functional both for children and adults. Moreover, in *KidsRoom*, if children felt confused about the interaction pattern, a teacher-like voice would whisper the instructions to them, such as "stay on the rug", much like to the instructions of the Goddess character in Brenda Laurel's *Placeholder* (1994). Even though this direction is very functional for an application that targets children, we tried to avoid explicit explanations during the participants' exploration of the story world of *Egg's Journey* (2007).

10.4. Environment Set up

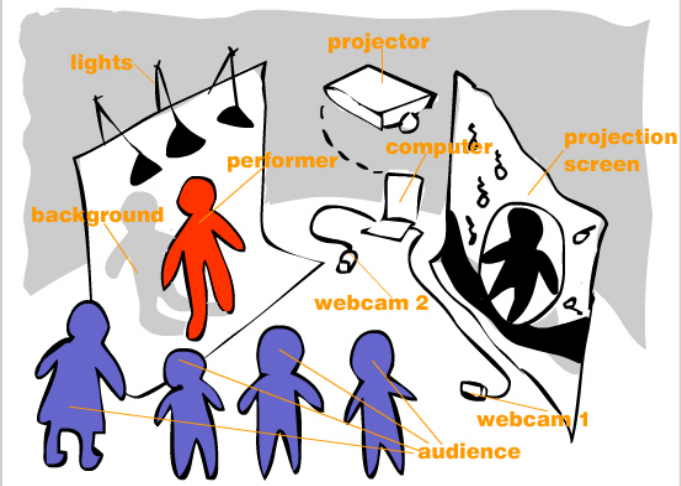

Figure 10.4.1 *Embodied Comics: Egg's Journey* environment setup plan

The environment (see Figure 10.4.1) consists of two white screens (one for background, one for projection), a set of lights, two webcams, one computer, and a projector. The first webcam captures the performer's actions. The second webcam captures the audiences' actions. Additional webcams may be added to capture the performer's action from additional angles of view. The performer's image is distorted, combined with virtual objects via Java code, and reflected onto the projection screen. The audiences' audio and kinetic participation show their impact on the performer's distorted projection. While their hands and arms are projected directly to the screen and the performer moves in the real space, he or she manipulates the virtual objects surrounding him or her.

We use a background screen and a set of lights to create a bright background behind the performer. By adjusting the webcam to use a relatively fast shutter speed, the performer will look quite dark in the camera, regardless of what kind of clothing she or

he is wearing. At the same time, the background screen is almost pure white which creates a sharp contrast between the background and the performer (see Figure 10.4.2). This kind of setup helps reduce the computing burden and interference in background subtraction as well as blob detection. (see Figure 10.4.2)

Figure 10.4.2 Environment setup – background

The interaction design aims to create a recursive arc of excitement and falling action by utilizing and redefining the aesthetics of comics, animation, film, and performance art. The participants' simultaneous distorted self-projections (the contour lines around their silhouettes) are the characters of this dramatic experience. The participants' masked presence on the screen triggers a set of decision points as their gestures are tied to virtual objects. While the participants are experiencing the narration, they become both the object and the subject of their own gaze. At the end, snapshots taken periodically during the happening supply a traditional comic strip version of the entire experience. Overall, regardless of the participants' ability to draw or design a comic strip, the experience turns out to be a comics generator.

10.5. The Story

The story of *Embodied Comics: Egg's Journey* presents a feminist perspective on procreation. The participants, regardless of their gender, play out the story of the female

egg in the reproductive system. Each participant, by collaborating with the audience or acting as a rival to them, tries to reach the fertilization site and select the best profile among the sperm that are rushing to the egg. During this journey, the performer can make use of a real stopper, an umbrella, and a flashlight. The journey is described in the text below, illustrated with storyboard images.

10.5.1. Discovery of the Story Location and Journey from Ovary to Fallopian Tube

The interaction starts when the performer enters the performance space. The performer sees his or her distorted silhouette standing on a soft-jiggling ground.

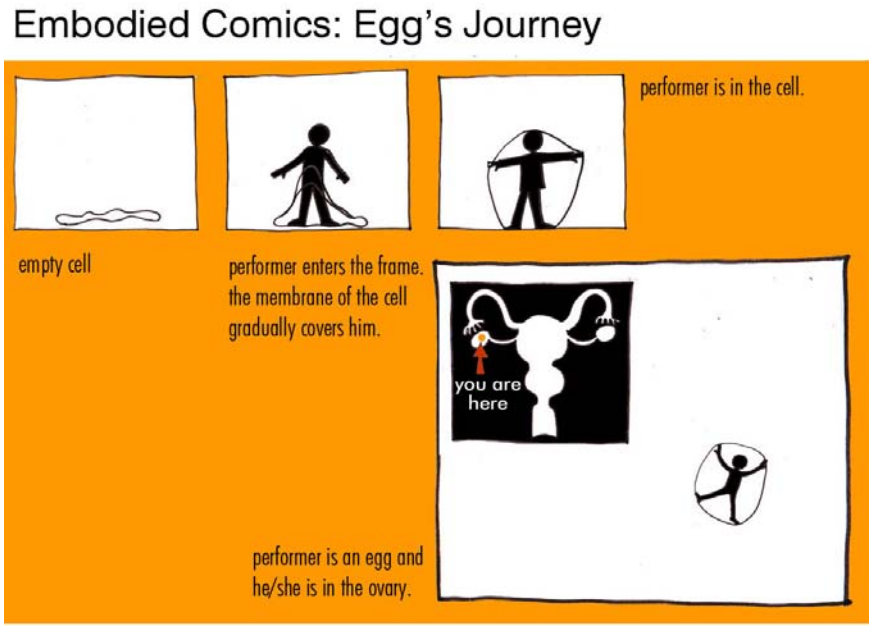

Figure 10.5.1.1 The Performer in the egg and navigation map

The performer is then gradually covered by the membrane of an egg (see Figure 10.5.1.1). A navigation map appears, enabling the performer to comprehend his or her location. The performer is actually in the reproduction system of a female body. The arrow on the navigation map points out the ovary with the explanation "You are here." At this point, the performer needs to jump from ovary to fallopian tube (see Figure 10.5.1.2).

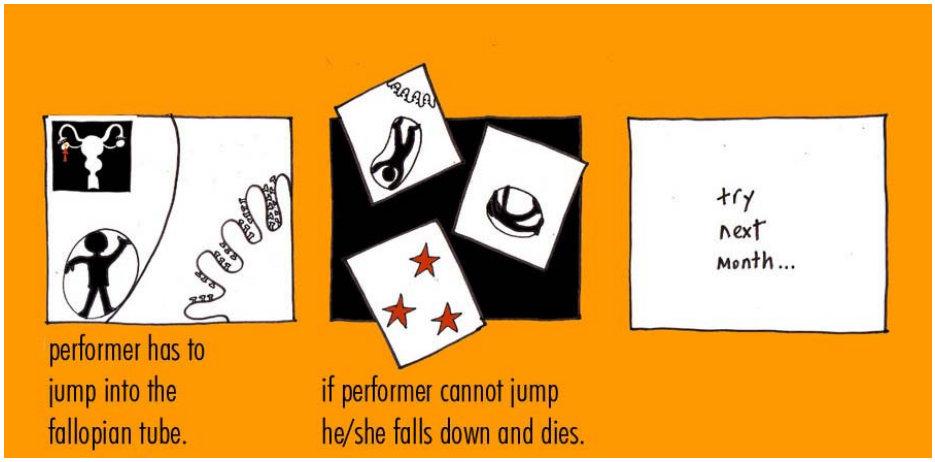

Figure 10.5.1.2 A jump from ovary to fallopian tube

The accomplishment of this step requires an actual physical jump. The performer should jump far enough so that his or her projected image falls into the borders of the fallopian tube (see Figure 10.5.1.2). Otherwise the performer sees himself or herself fall down, and sees the message “try next month.” Since “try next month” is a self-conscious gag based on the verisimilitude of the environment, the performer can immediately re-start his or her interaction from the very beginning. In this context, the jiggling-soft ground appears as a very fragile tissue (see Figure 10.5.1.3). The performer cannot stand straight on the same location for a long time, and instead must move around constantly. Otherwise his or her weight tears apart the tissue and the performer sees him or herself falls down.

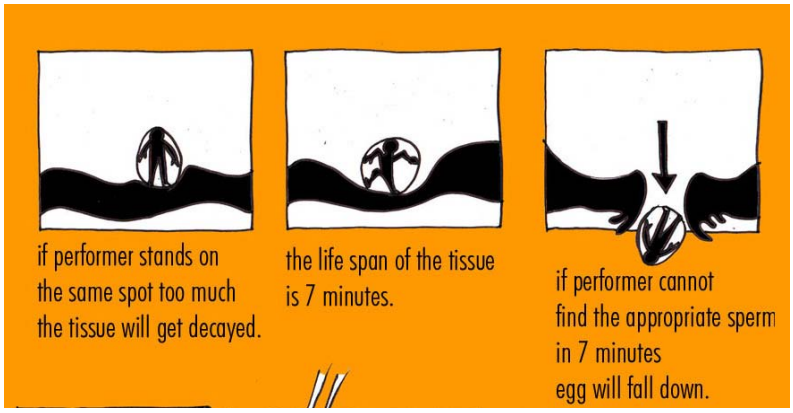

Figure 10.5.1.3 Fragile tissue

The implementation of the falling-down scenes is based on prevailing comics conventions. The snapshots of the performer are scaled down, tangled or turned upside down, and placed into dynamic frames with stars that represent the plummet.

10.5.2. From the Fallopian Tube to the Site of Fertilization

The performer who succeeds in jumping into the fallopian tube then must travel to the fertilization site. At this point, the audience, by waving their arms, can hold, roll, and move the egg forward (see Figure 10.5.2.1).

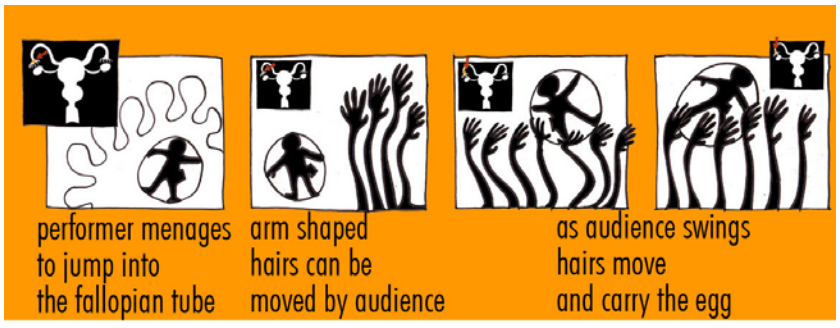

Figure 10.5.2.1 Audience interaction

The distorted image of the audience's arms and hands resembling the hairy structures in the fallopian tube, appear on the screen. As soon as the egg arrives at the site of fertilization, a set of sperm rush toward to the egg (see Figure 10.5.2.2).

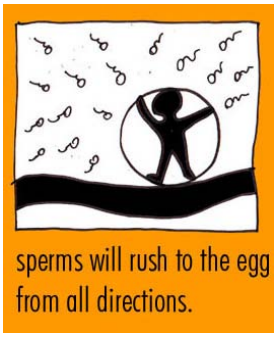

Figure 10.5.2.2 Rushing sperm

If the egg tries to escape, the sperm follow close behind. The performer can hold any sperm with his or her hand and see the possible child that the egg and that particular sperm can produce (see Figure 10.5.2.3).

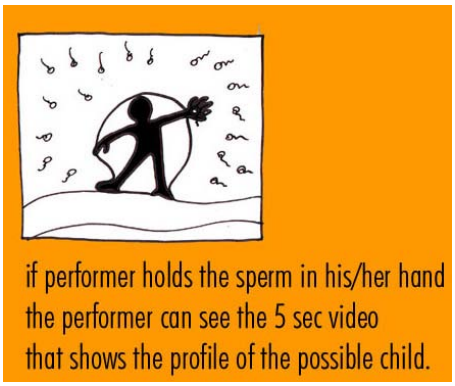

Figure 10.5.2.3 Seeing the profile of the possible child

By checking the sperm one by one, the performer can find out the most appropriate option and pull the desired sperm into the egg (see Figure 10.5.2.4). In this case, the performer sees the profile of the possible child as a grown up. This action completes the interaction and another performer may come up from among the audience.

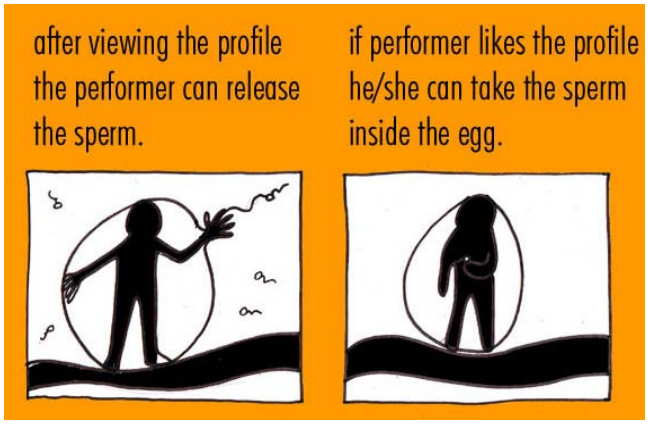

Figure 10.5.2.4 Releasing a sperm or taking the sperm in

A sperm can also penetrate the membrane if the sperm touches the membrane for more than 5 seconds. If the performer lets a sperm penetrate the membrane, the performer cannot make a choice (see Figure 10.5.2.5).

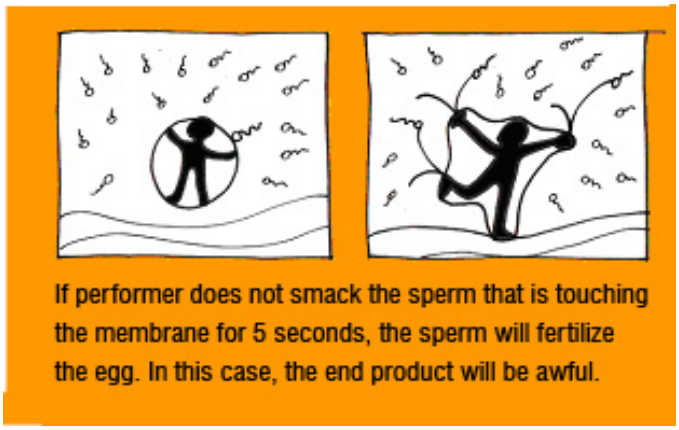

Figure 10.5.2.5 Smacking and kicking the sperms

In this case, the sperm makes the choice and completes the interaction. In order to prevent this unwanted penetration, the performer should smack and kick the rushing sperm. Sperm bounce back if the performer hits them. If the performer holds one sperm, the other rushing sperm suspend in the air and let the performer view the animation that exhibits the profile of a possible child.

10.5.3. Possible Dangers

While the egg is at the site of fertilization, an artificial insemination tube may appear and try to suck the egg in (see Figure 10.5.3.1).

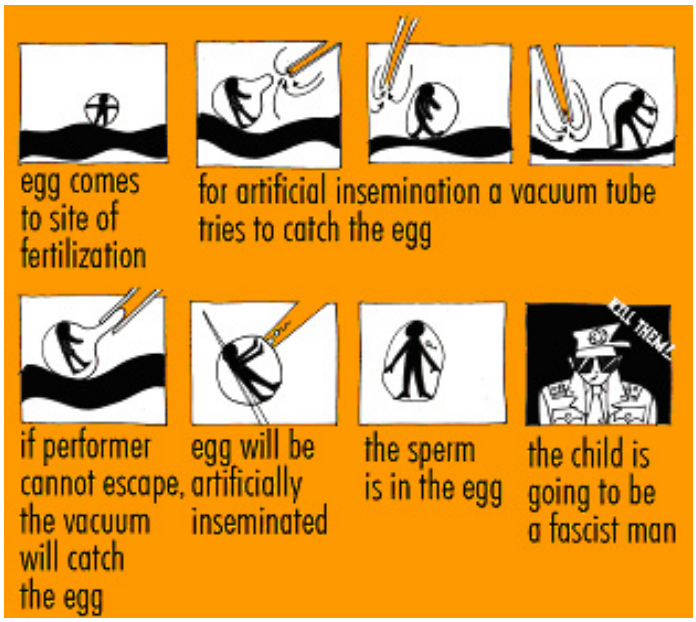

Figure 10.5.3.1 The danger of being sucked in to an artificial insemination tube

If the performer cannot escape from the tube, it sucks the egg in and the egg is artificially inseminated. Since this process does not contain a selection action taken by the performer, the end product of this event gives a profile of a person who has fascistic traits. To avoid being artificially inseminated the performer can take a real physical stopper from the environment and try to plug the entrance of the virtual artificial insemination tube (see Figure 10.5.3.2).

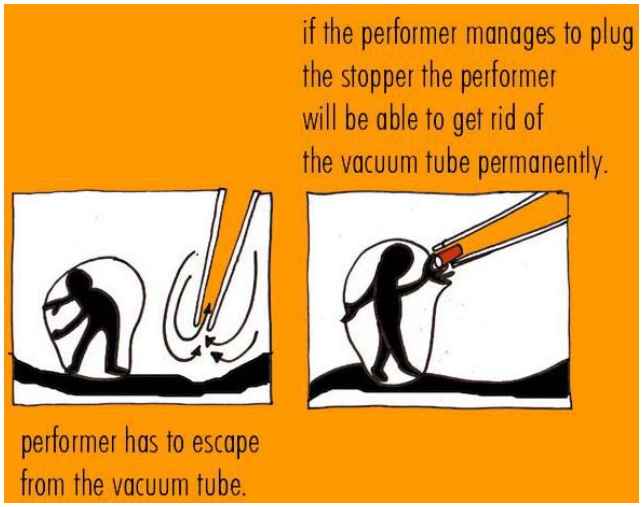

Figure 10.5.3.2 The use of first object, stopper

If the performer manages to plug the physical stopper into the projected virtual tube, the tube is permanently eliminated. Otherwise, the danger of being sucked into an artificial insemination tube reappears from time to time.

Audiences can increase the number of sperm in the environment (thereby increasing the challenge for the performer) by clapping their hands (see Figure 10.5.3.3). If the number of sperm becomes enormous, the environment automatically sends the sperm-killer rain. This virtual spermicide descends from the top of the frame and kills the sperm it encounters. In order to prevent the loss of all sperm in the environment, the performer must take a real physical umbrella from the space, open it up, and protect some of the sperm by covering them with the umbrella.

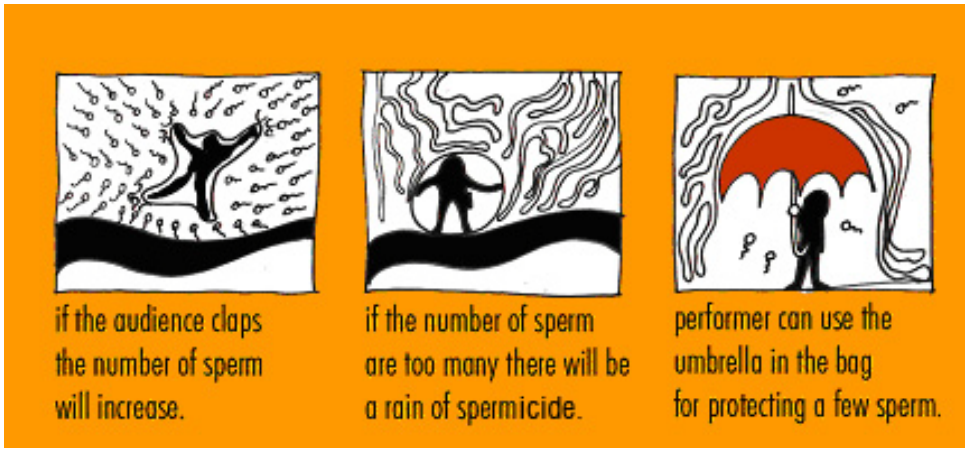

Figure 10.5.3.3 The use of second object, umbrella

The performer can also use a real flash light to deactivate some of the rushing sperm. Sperm that face the light beam become suspended in the air like a deer in headlights (see Figure 10.5.3.4).

Figure 10.5.3.4 The use of third object, flashlight

10.6. Humor Strategies As a Communication Tool

The humor strategies that we have developed for *Embodied Comics*: *Egg's Journey* aim to jolt the established male-centric discourse of reproduction narrations. In these conventional narrations, the human egg is represented as a stable, slow, passive, and conceiving target, while the sperm take the role of aggressive-active agents who can

compete with each other and make the selection. Keller (1995) synthesizes the analysis of this narration done by Martin (1991) and Alberts et al. (1990) and states

> Twenty years ago that process could effectively and acceptably be described in terms evocative of the Sleeping Beauty myth (for example, penetration, vanquishing, or awakening of the egg by the sperm precisely because of the consonance of that image with prevailing sexual stereotypes (see Martin 1991). Today a different metaphor has come to seem more useful and clearly more acceptable: in contemporary textbooks fertilization is more likely to be cast in the language of the equal opportunity (defined, for example, as "the process by which egg and sperm find each other and fuse" [Aberts et al. 1990:868]). (p. xii)

In *Egg's Journey* (2007) we aimed to alter this classical sexist discourse by blurring it with humor strategies. The performer can take the egg's point of view regardless of gender. Also, in this narration, the egg holds the agency. It jumps, floats, takes a journey, and finally makes the selection. The performer's ability to smack the sperm alters the established hierarchy between egg and sperm.

Figure 10.6.1 Profile 1 - child version

The animated profiles of possible children establish the second level of our humor strategies. The distinction between the child and adult versions of a profile will highlight and play with the human tendency towards stereotypical thinking. Most of the time, the performer will be disappointed or surprised when they see the result of their choice. The beautiful, blond, white, well dressed, healthy, cute, playing girl will be a good target for selection (see Figure 10.6.1). However, if the performer falls in the trap and selects this profile, the grown up version of the same child may appear as an alcoholic young woman who has an enormous credit card debt and who asks her mother (the performer) to cover it (see Figure 10.6.2).

Figure 10.6.2 Profile 1 – adult version

As another example, a naughty boy who is about to put his cat into the washing machine initially appears as a bad target (see Figure 10.6.3), but his grown up version exhibits a seemingly intelligent young man who has invented the “gravitron” ride for amusement parks (see Figure 10.6.4).

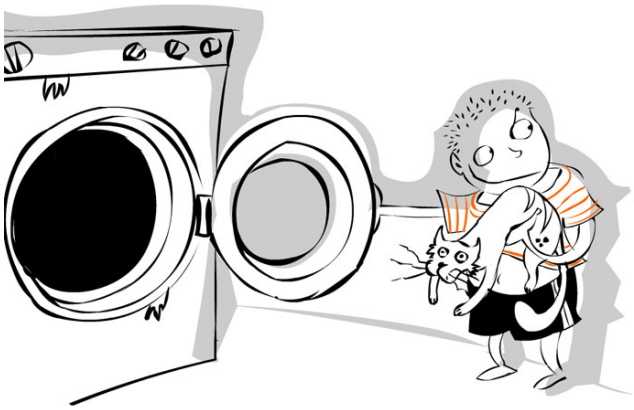

Figure 10.6.3 Profile 2 – child version

Figure 10.6.4 Profile 2 – adult version

Although these examples of an alcoholic blond woman in debt and a smart inventive man reveal another form of stereotypical thinking about men and women, they do not seem like stereotypical cases when viewed in the context of the numerous profiles collected in the database. Overall, the database reflects a broad range of character types, both male and female.

10.7 Exemplifying the Merger of Conventions of Film, Animation, Comics, and Performance In *Egg's Journey*

In this chapter, I have described the Embodied Comics environment and *Egg's Journey*, as a sample interactive story designed for the Embodied Comics environment. In earlier chapters, I have identified the conventions of older media that full-body interactive installations can remediate. In this chapter, I will use *Embodied Comics: Egg's Journey* to exemplify the merger of these conventions.

10.7.1. Embodied Comics and Early Impact of Digital Media on Film

In digital film and animation, the miniaturization of the camera and the use of virtual camera increased the director's freedom to create mobile frames and to use extreme camera angles. The animated parts of *Egg's Journey* are created in Flash environment and there is no real camera involved. The story is narrated from the point of view of the egg which travels in the tubes and veins of the female reproductive system.

With such tools of digital filmmaking as the manipulability of the pixel, color correction, inclusion of typographic and graphic components, filmmakers have created scenes that blur film studies terminology. This is also true in *Egg's Journey*, where the discussion of reflexivity requires the use of the novel term, boundary of illusion, that I defined and discussed in Chapter 8.

As a result of the increase in the plasticity of the digital film frame, live action film narration began mimicking the conventions and aesthetics of the animation genre. *Egg's Journey* takes this shift from live action to animation one step further. In *Egg's Journey*, the system digitally captures a live action performer's image and procedurally

renders it as contour drawings. The Embodied Comics environment simultaneously generates an animation from a live action image.

The miniaturization and absence of a camera, the loss of profilmic reality, the low cost of a digital camera and digital video tape, and the tendency to use natural lighting and environment has led to the rise of the casual look in digital films**.** Anyone with any kind of daily apparel can participate and experience *Egg's Journey*. Even though we used background curtains and lighting, an enthusiast can implement a similar environment in a well lit part of her home by using a white wall as a background.

The lack of a chemical development process and the smallness of digital tape and DVD also reduce the production and distribution costs and supply freedom to digital filmmakers to make experiments on long takes. In *Egg's Journey,* the camera continuously tracks the performer's actions and there is no limit on the duration of the take.

Digital editing tools have made non-linear editing possible. Non-linear editing contributed to the blurring of space-time unity in film narration. In *Egg's Journey,* the performer coexists in the real space and on the projection screen. Moreover, the story of *Egg's Journey* is based on gags and episodes that occur non-linearly.

10.7. 2. Embodied Comics and the Early Impact of Digital Media on Comics

The use of animation in a Web comics story does not necessarily make the narration animation-like if it is used in the following ways: a still frame contains a small and looping animation; the content of the frame is motionless unless there is user interaction; animation creates invisible frames or smooth transitions; animation in a still frame creates a gag. In *Egg's Journey,* the performer has to remain still to catch the

sperm. This exemplifies the use of small and looping animation within a still frame. In addition, when the performer holds a sperm, an animation portraying a possible child profile appears. The invisible transition from a child profile to an adult is done via animation.

We did not attempt to create a literally infinite canvas. In *Egg's Journey,* the represented story space is a large canvas. The performer can navigate the egg within the female reproductive system by using his or her full-body motion.

In current Web comics, the participatory frame is limited to the size of a monitor. In *Egg's Journey*, we use a projection screen instead of a monitor. In the Embodied Comics setting, performers use their full-body motion for interaction. The space in front of the projection screen is a larger environment that enables the performer to interact using his or her full-body. A PC environment offers a more limited interaction space.

There are examples of comic strip and character generators among PC-based Web comics. In *Egg's Journey*, at the end, snapshots taken periodically during the happening supply a traditional comic strip version of the entire experience. The system can procedurally capture snapshots of all interactions and lay out the snapshots on a storyboard template. *Egg's Journey,* then, takes the comic strip and character generators of PC based Web comics one step further. In current Web comics, pre-designated items in a database are used for generating comic strips and characters. In *Egg's Journey,* the images in the database accumulate as the performer experiences the story.

10.7. 3. Impact of Analog Technology on Performance Art

During the 1960's a group of performance artists (Yoko Ono, Valie Export, and Marina Abromović) designed participatory art pieces and purposefully placed themselves

in a vulnerable position by providing tools that could enable the participants to hurt the artists. Taking the risk of being physically or emotionally wounded enabled the performers to rechannel the energy that was released by the public breaking of taboos. In *Egg's Journey*, viewers have more power than the performer since they have the agency of collaborating with the performer or refusing this collaboration. The viewers keep teasing the performer who is navigating the egg and trying to reach the fertilization site.

While Ono, Abromović, and Export were placing themselves in a vulnerable position, they were decisively pushing the participants into a socially awkward situation by playfully embarrassing the participants. Pushing the participants out of their comfort zones is a strategy of meaning-making. This strategy comments on taboos of personal space, gender, social class, and social norms. In *Egg's Journey*, taking the role of an egg and playing with the sperm in public appears as a playful challenge for some participants especially for adult males. Moreover, in the process of the selection of child profiles, the performers have to confront publicly their tendency to think stereotypically.

The inclusion of performance pieces in contemporary art museums has altered the conventional meaning of a museum space. The function of a museum has shifted from a space for exhibition where visitors cannot touch the art work to a place to produce art by interacting with the artworks. If *Egg's Journey* had been exhibited in a traditional museum setting the participants would have received a comic strip version of their own interaction. In this way, participants would have taken a piece of the artwork away from the museum with them.

10.7. 4. Embodied Comics and the Impact of Digital Technology on Performance Art

The procedural quality of digital media has enabled artists to select moments from an entire event and reorganize those moments in a non-linear fashion. In *Egg's Journey*, the story takes place inside the female reproductive system and simultaneously in the future of the larger world where child profiles grow into adults. This story structure fragments time and space representations. Moreover, the system periodically takes snapshots of the performer's experiences. Rearranging these collected moments on a comic strip template also exemplifies the fragmentation of time and space.

The procedural qualities of the digital medium have enabled digital artists to create a responsive set that gives simultaneous reactions to the performer's actions. In *Egg's Journey***,** the interaction starts when the performer enters the performance space. Each full-body act receives a simultaneous response from the environment as follows: Egg moves; the membrane of the egg changes its shape; sperm bounce back; and the animation of selected profiles play.

In digital interactive environments, the concept of delay became the key narration tool that builds up expectation and surprise. In *Egg's Journey* the surprise that the comic strip generator creates is about the concept of delay. The collected snapshots of the performer's experience are invisible to the performer until she sees the generated comic strip.

The celluloid-electronic double (film and video projection) grew into the digital double (digital image). Since a digital image is independent of profilmic reality, the digital double, with its transformative quality and its simultaneous responsiveness, has

more plasticity than the celluloid-electronic double. In *Egg's Journey*, the performer sees his or her self-projection as a comics drawing inside a human egg standing on a soft and jiggling ground on the projection screen. The distortion of self-projection is massive. In that sense, *Egg's Journey* makes use of the manipulability of the pixel and plasticity of the digital double.

The advent of physical computing within performance art has increased the capabilities of a responsive set. In *Egg's Journey*, during the journey to the fertilization site, the performer can make use of a real stopper, a physical umbrella, and an actual flashlight and can give these items surprising functionality.

The capabilities of a responsive set have become more sophisticated as a consequence of the merging of virtual images and real performers. In *Egg's Journey*, the performer can see his or her distorted silhouette, which looks like a comics character on the projection screen. The viewer can see the live action performer and the performer's reflection simultaneously.

10.7. 5. Use of Physicality and Distance in Embodied Comics

In full-body interactive installations, the performer has a referent such as a point of view or a self-projection that represents the performer. Using an abstracted self-projection image is one of the ways of implementing the necessary distance required to establish a strong sense of presence. In *Egg's Journey*, in order to establish that conceptual distance, we used the silhouette of the performer rendered with smooth contour lines.

10.7. 6. The Boundary of Illusion in Embodied Comics

The concept of nested boundaries of illusion is a fertile concept for meaning-making in full-body interactive installations. Even though existing full-body interactive installations make an attempt to use this potential, most have limited themselves by giving all participants the same agency. In the existing full-body interactive installations as I discussed in Chapter 8, the boundaries of illusion are nested but each boundary of illusion has the same quality.

In *Embodied Comics: Egg's Journey* (2007) we have designed two levels of non-repetitive nested boundaries of illusion. In order to break that repetitive quality

1. We assigned different types of agency to the participants standing at different locations.

2. We designed a possibility for collaboration with this different set of agencies.

In *Egg's Journey* (2007) the performer sees himself or herself as the egg in the female reproduction system on the screen and tries to reach the fertilization site (see Figure 8.7.6.1).

Figure 10.7.6.1 The nested boundaries of illusion are not repetitive in *Embodied Comics: Egg's Journey* (2007)

The viewers can help the performer in his or her aim of reaching the fertilization site by waving their arms. The projection of their arms appears as the hairy parts of the inner fallopian tube and carries the egg to the fertilization site. The performer's boundary of illusion is the screen. The viewers' boundary of illusion is between the performer and themselves and includes the performer and the screen. Since the performer's success at reaching the fertilization site is dependent on the viewers' agency the performer's boundary of illusion is affected by those of the viewers. The performer cannot see the viewers but he or she can see the impact of the viewers' actions on the screen. Viewers have the largest range of knowledge in the story development.

In *Egg's Journey* (2007) the nested boundaries of illusion have only two layers. Nevertheless, this example of Embodied Comics illustrates the possibility of establishing dynamic relationships among the layers of nested boundaries of illusion. The concept of nested boundaries of illusion is a fertile meaning-making tool when combined with the notions of agency and range of knowledge.

10.7. 7. Elastic, Dynamic, and Embodied Frame in Embodied Comics

Digital media has also influenced comics narration by making the static borders of the frame elastic and by making the contents of a single frame dynamic. Moreover, the frame component is participatory, since performers can interact with it with their full-body movement. Because the full-body interaction is possible with the elastic and dynamic frame, the frame becomes embodied as well.

The frame component in *Egg's Journey* is elastic, dynamic, and embodied in the following ways. In *Egg's Journey* (2007), the performers can see their simplified,

contour-line-based projection surrounded by a membrane of a human egg on the projection screen (see Figure 10.7.7.1).

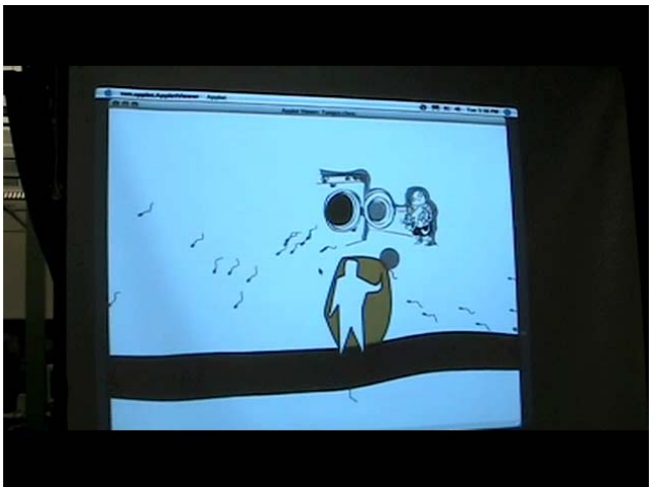

Figure 10.7.7.1 The human egg: The use of dynamic frame in *Egg's Journey* (2007)

The membrane of the egg encapsulates the performer in an oval shaped frame.
The membrane of the egg constitutes an elastic frame border. This elastic border creates a zone that the performer possesses and protects from outside impact, such as the attack of the sperm. In this case, the frame is intrinsic and diegetic and it situates the sphere of interaction The performer can push and bend the elastic borders of the membrane. Moreover, the egg rests on a tissue. The tissue continuously slides toward the right side. In *Egg's Journey,* even if the performer stands still the contents of the frame continuously change. Moreover, the contents of the small frame (human egg) also change as the performer moves his or her body. The performer navigates and manipulates the membrane of the egg by using his or her entire body. The elastic and dynamic frame becomes embodied.

10.8. Conclusion and Future Works

In this chapter, I have described the Embodied Comics environment and our installation *Egg's Journey* (2007). I have also illustrated the use of the following meaning-making strategies that I previously identified in this dissertation:

1. We created an elastic, dynamic, and embodied frame which responds to the participant's full-body motion.

2. We have used two levels of non-repetitive nested boundaries of illusion by giving different agencies to the performer and the viewers.

3. We used the silhouette of the performer rendered with smooth contour lines in order to establish a conceptual distance. The transformation of the live image to a cartoon character enabled us to benefit from the transformative qualities of the digital double.

4. We gave surprising functionalities to three objects (a stopper, an umbrella, and a flashlight) in order to exemplify the intricate use of props.

5. We created an environment that is productive for the generation of humor, creating a purposeful offense based on superiority theory.

4. We designed the idea of a comics generator for a full-body interactive installation that procedurally creates items in a database throughout the interaction of the performer and the viewers.

Implementing *Egg's Journey* helped me to envision the meaning-making strategies that could shape a future Embodied Comics story design. In future work, the performer should have extensive agency to interact with the elastic, dynamic, embodied, and nested frame. In *Egg's Journey*, we used a stationary camera and representational panel. In a future Embodied Comics story design, using a non-stationary camera and

representational panel might be helpful to increase the expressiveness of the environment. The number of non-repetitive levels of nested boundaries of illusion can also be increased by creating groups of performers with different kinds of agency and varying ranges of knowledge.

CHAPTER 11

CONCLUSION

The idea of taking comics off the screen or printed page is not about making comics more realistic and life-like. It is about discovering the potential of digital media and the artistic opportunities available to a creative mind.

When comics and animation narration are recontextualized in a digital performance setting, we must redefine the conventions of comics and animation. This redefinition process also points out the fertile areas for meaning-making strategies for full-body interactive installations. I identified the conventions of older media that full-body interactive installations can remediate and stated those conventions in the conclusion part of each chapter. In this chapter, I will narrow down the long list of conclusions and point out the most fertile areas for meaning-making strategies for full-body interactive installations.

1. **Impossible Story Worlds**

In digital film, the use of small cameras and/or absence of a camera has increased mobility and made extreme camera angles possible. An Embodied Comics environment can benefit from camera mobility and extreme camera angles by establishing "impossible" story worlds such as the inside of a human body.

2. **Plasticity of Digital Double**

The absence of profilmic reality in digital imaging has increased the plasticity of the frame. As a result, conventions used in animation have been reconceptualized for use

in digital film. increased plasticity. Since digital media allow the procedural manipulation of the image, computer vision based environments can also benefit from this plasticity.

3. **Movement in Comics**

The screen-based Web comics use movement. The use of animation in a comics story does not necessarily make the narration animation-like.

4. **Infinite Canvas**

Scott McCloud's infinite canvas concept contains a vast potential for the creation of new meaning-making strategies. Existing Web comics use a large and finite space but not an infinite canvas. The procedurality and spatiality of digital media has allowed comics artists to generate literally infinite canvases. Geotagging is an underemployed possibility for collaborative digital comics creations using an infinite canvas.

5. **Comic Strip and Character Generators**

The procedurality of the digital medium can generate comic strips and characters. For example, Embodied Comics environments can periodically take snapshots of the experience and generate a traditional comic strip version of the entire experience.

6. **Confronting the Viewer**

By purposefully offending viewers, performers become vulnerable. Offense and vulnerability turn into meaning-making tools. If the artist can design a playful offense for the Embodied Comics performer to engage in, that playful offense and the resulting vulnerability may create humor.

7. **Fragmentation of Space-time**

The elements of space and time become non-linearly fragmented and indexed in full-body interactive environments. The performer's multiple presence in real space and time on the projection screen contributes to this fragmentation.

8. **Simultaneity**

The responsive set of digital performance spaces generates simultaneous responses. This simultaneity turns into a powerful meaning-making tool. In an Embodied Comics environment, the system projects the comics version of the performer on the projection screen. This simultaneous transformation constitutes the essence of Embodied Comics.

9. **Delay**

Digital environments can index and delay information and then procedurally recompose it. The design of comic strip generators in Embodied Comics environment exemplifies the creative use of delay.

10. **Expansion of Performance Set**

As the use of telepresence to connect participants in a limited number of locations evolved into the use of World Wide Web with this evolution the potential for creating world wide events involving massive number of participants emerged. Full-body interactive installations can use a larger performance space than a traditional set designed for a happening.

11. **Massive Number of Participants**

The design of participatory pieces for a massive number of participants became easier. Full-body interactive installations can involve massive number of participants by using World Wide Web.

12. **Creating Unaware Participants with Surveillance Technologies**

Especially with surveillance technologies, digital media artists are enabled to create participants who are unaware of their contribution.

13. **Elastic Distance and the Mobility of Components**

In full-body interactive installations, the camera and representational panel can become mobile instead of being stationary. Such mobility supplies viewers and performers more agency and freedom to use their full-body motion in their interaction with the environment. A wide representational panel on which performers can walk can also increase the agency of the performers. The use of a mobile camera can expand the meaning-making potential of full-body interactive installations and also contribute to meaning-making through nested boundaries of illusion.

The distance between performer and the representational panel can vary from zero to miles. While there are installations benefiting from zero distance, there are no full-body interactive installations that utilize an extreme distance such as a satellite camera capturing a performer on the earth.

14. **Intricate Uses of Props**

The absence of storytelling in full-body interactive installations eliminates the intricate use of props. Just as the tracking people and gestures is possible, so too is the tracking of objects (props). If full-body interactive environments were to be utilized for

storytelling purposes, the ability to track objects in full-body interactive environments could be used more extensively.

15. **Mediated Self-reflection**

In order to prevent the performer's alienation, a conceptual distance is necessary between the performer and the self-projection. Using an abstracted self-projection image is one of the ways of implementing this necessary distance in order to establish a strong sense of presence.

16. **Nested Boundaries of Illusion**

The mobility of the performer(s) in full-body interactive installations introduces a very fertile meaning-making opportunity based on self-consciousness and reflexivity in relation to the notion of fourth wall. However, the theatrical term, fourth wall, remains insufficient to explain the dynamic cases that can occur in improvisational theater, performance art, and in digital performance. The creation of a new term, the boundary of illusion, is necessary.

The procedural qualities of digital media give the digital media artist the ability to create and control nested boundaries of illusion. In this way, a digital media artist can generate a playful interaction for a full-body interactive environment by assigning different kinds of agency to different participants, by enabling collaboration among participants, and by varying the range of knowledge held by various participants. The concept of nested boundaries of illusion creates a fertile and unexplored area that requires more attention from both digital media artists and scholars.

17. **Elastic, Dynamic, and Embodied Frame**

The frame component in comics and animation changes when moved to digital performance spaces because of the procedural and participatory qualities of digital media. In PC based digital comics, the size of the frame is limited by the size of the monitor and the manipulation of dynamic borders is limited by the use of mouse and keyboard. In Web comics, an elastic and participatory frame border and dynamic frame content is possible. In full-body interactive installations, the performer can manipulate the elastic and dynamic frame with her or his full-body motion. In this way, the frame also becomes embodied.

18. **Dynamic and Participatory Thought Balloons, Movement Lines, Typographic Components, and Icons**

Not only the borders but also the contents of the frame (e.g. speech and thought balloons, movement lines, typographic components, and icons) become dynamic and participatory in full-body interactive installations.

These new meaning-making methods have not been utilized fully in the creation of engaging digital performance spaces. These underdeveloped areas make an exciting invitation to the digital media artists to push the boundaries of the medium.

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VITA

ÖZGE SAMANCI

SAMANCI was born in Izmir, Turkey. She received a B.A. in Mathematics from Bogazici University, Istanbul, Turkey in 1999 and a M.A. in Film and Television from Istanbul Bilgi University, Turkey in 2001. She received her second MA degree in Communication Studies from Ohio University in 2005 before coming to Georgia Tech to pursue a doctorate in Digital Media. Her book, Animasyonun Onlenemez Yukselisi (Irresistible Rise of Animation) was published by Istanbul Bilgi University in 2004. In this book, she analyzed a set of films that incorporate live action and animation. She is a published comics artist and her comics appeared in several humor-film-art magazines of Turkey. In 2008, she mounted a solo exhibition in Atlanta of 248 artworks from Ordinary Things, her online comics-collage journal. She is also a film maker and multimedia artist and her short films and digital media work have been featured internationally.